A STUDY OF SUPPLY AND USE OF PHARMACEUTICALS IN SATARA DISTRICT

Dr. Anant Phadke
Audrey Fernandes
L. Sharda
Pratibha Mane
Dr. Amar Jesani

Foundation for Research in Community Health

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Community Health Cell
Library and Documentation Unit
BANGALORE

A STUDY OF SITTING AND USE OF TOILETS

Dr. Anant Phadke
Audrey Fernandes
Dr. Sharada
Pratibha Mane
Dr. Amar Jesani

supported by
The Ford Foundation

June 1995

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FOUNDATION FOR RESEARCH IN COMMUNITY HEALTH

Pune Office :
3/4 TRIMITI-B APTS.
85, ANAND PARK, AUNDH,
PUNE 411007.

Bombay Office :
84 - A, R. G. THADANI MARG
WORLI,
BOMBAY - 411 018

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What is The Foundation for Research in Community Health (FRCH)

The FRCH was established in 1975 as a non-profit voluntary organisation for undertaking research in the problems of health care of the people of India.

Despite our rich tradition in the field of health, the vast majority of our people who live in the villages and slums still do not receive any meaningful form of health care.

FRCH, with its staff from various disciplines such as doctors, social scientists in management, documentation and economics, is trying to determine the reasons for this failure and is attempting to evolve cost-effective alternative strategies which can be utilised on a countrywide scale.

This has entailed conceptual studies which have resulted in reports like ' Health for All: an alternative Strategy,' which has influenced our National Health Policy and the Five-Year Plans.

These studies have revealed the importance of socio-economic, cultural, environmental, political and human factors which have hitherto not been given due recognition and without which the available knowledge and technology can not succeed in achieving our health goals.

FRCH conducts field studies, especially in rural areas, to gain a better understanding of these problems at the grassroots and experiments with new approaches like the training of semi-literate village women, as in the Mandwa Project, which demonstrated that, majority of our health and illness problems can be effectively tackled by the people themselves.

FRCH also aims at demystification and wider dissemination of knowledge on health and illness, with the aim of creating a ' People's Health Movement'

These can only be achieved with your involvement and support.

DR. N. H. ANTIA
Director

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FOREWORD

Of all the need-based countries of the world, except China, India is the only one which is almost self-sufficient in the production of drugs and pharmaceuticals. Starting with the production of Rs. 10 crores at Independence, this industry has now reached almost Rs. 7,000 crores which is almost 20% of the present health expenditure of our country.

Unfortunately, the type and quantity of drugs which are produced does not seem to be in keeping with the disease pattern of our country because the vast majority suffer from the diseases of poverty. There is a plethora of over 60,000 drugs and formulations of allopathy and now over 20,000 of the Ayurvedic variety. Yet essential drugs for national programmes are generally in short supply. The WHO list of essential drugs has about 300 drugs and 500 formulations. A well-medicated country like Norway has about 2000 formulations and Bangladesh has 3500. It is evident that the vast majority of the irrational drug combinations and formulations like of tonics, digestives, cough and cold remedies etc are unnecessary and their prescription irrational. This has resulted in over-medication of the rich and is even diverting 8% of the expenditure of the poorest families from food to irrational medication. This now poses a new health hazard to our people. It is impossible for the government to monitor the quality or pricing of this vast number of formulations.

Inspite of this burgeoning drug industry, there is hitherto been no systematic study regards the supply and use of drugs which is a basic requirement in planning of the country's health service. This unique report, hence presents a detailed study of the supply and use of drugs in the Satara district - an average district in Maharashtra. The drug usage for both the public as well as private sectors have been covered by this study, not only to determine the total quantity of the drug usage but also for the rationality of the prescriptions. This study reveals the extent of over-drugging as well as the irrationality of prescriptions. The drug consumption in this district is estimated at Rs. 87 per capita per year which, if extrapolated to the country as a whole, would mean about a fifth of its overall health expenditure. This study also demonstrates that 97% of the drug expenditure is in the private sector. This expenditure is based not on people's actual needs and yet the clamour of the drug industry is for further increase in production of drugs.

This study also indicates the need for continuing education of doctors on the rational use of drugs and the need for elimination of irrational drugs sold in our country. This study, the first of its kind in India, is exploratory and many more such studies should be conducted in various parts of our country.

Dr. Anant Phadke who has been in overall charge of this study has been ably assisted by L. Sharda and Audrey Fernandes. Ms. Fernandes was in-charge of Part I and Section B of this study. These researchers must be congratulated for the untiring efforts in the field where this study was undertaken and for compilation and analysis of the extensive data collected by them.

We are thankful to the Ford Foundation for their grant for this study.

Dr. N.H. Antia, (FRCS, FACS (Hon.)
Director.

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OUR INVESTIGATORS

Mrs. Bhagwat Sunanda

Ms. Dhondugade Savita

Mr. Gundesha Subhash

Mr. Kadali Shriniwas

Mr. Kalbhande Raju

Mr. Kulkarni A. R.

Ms. Mane Pratibha

Mr. Pandit Milind

Mr. Pawar Arun P.

Ms. Pungalia Sarita

ACRONYMS

Key to the acronyms used in this report

CH - Cottage Hospital

CME - Continuing Medical Education

INRUD - International Network for Rational Use of Drugs

M.O - Medical Officer

OPD - Out Patient Department

OTC - Over the Counter Drug

PAG - Prescription Analysis Guidelines

PHC - Primary Health Centre

PHF - Public Health Facility (PHC/RH/CH)

RH - Rural Hospital

RMP - Registered Medical Practitioner

SDTR - Standard Drug Treatment Regimen

WHO - World Health Organisation

A STUDY OF SUPPLY AND USE OF PHARMACEUTICALS IN SATARA DISTRICT

(Summary)

In India, about Rs. 7000/- crores of drugs are consumed every year. It is acknowledged that substantial part of these drugs are irrational combinations which are also wrongly used. In the Government sector, there is a great deal of shortages of drugs. The current study tries to go into the details of the supply and use of drugs in an average district in Maharashtra. No such district level study has been done so far in India.

Part I

SUPPLY OF PHARMACEUTICALS IN SATARA DISTRICT

1. Objectives

To study the amount and the pattern of drug supply to the public and private sector in Satara district, the shortages in the public sector.

2. Methodology

Based on socio-economic indicators of development, (CMIE index), drug supply and OPD attendance in public health facilities, Satara district was chosen as an average district in Maharashtra. Based on socio-economic considerations, the talukas in Satara district were divided into developed, average and drought-prone zones. Three PHCs and one Rural Hospital from each zone (9 out of 69 PHCs and 3 out of 10 RHs), one Cottage Hospital (out of two) and the district Civil Hospital were selected to study the amount of each drug indented and supplied to the Government health facilities, shortages, if any, and the dynamics of supply, utilization and shortages. The total number of drugs and their formulations supplied, were recorded in physical terms as well as their prices to arrive at the drug-expenditure. All these data were re-arranged as per the categories of the WHO Essential Drug List.

To study the regularity of availability of drugs, the date of supply and the date of nil stock were recorded for each drugs. Depending upon the availability in days, of different drugs, they were grouped into six categories - i) Always Available ii) Regularly Available iii) Irregular iv)Very Irregular v) Effectively Not Available vi) Never Available.

An estimate of the total sale of drugs in the private sector was made on the basis of informal yet very reliable sources of information.

3. Results

3.1 - Total Drug Supply

Our findings of representative sample of PHCs and Rural Hospitals if extrapolated to the district level, give the cost of all category of drugs (excluding Leprosy, Contraceptives and vaccines under the immunization programmes) supplied to the public sector as follows.

	Average cost of supply/unit (1991-92)	No. of	Total Units
PHC	Rs.39,495.80	69	2725210.20
RH	Rs. 95,697.49	10	956974.90
Cottage	Rs. 2,15,080.00	1	215080.00
Civil	Rs.17,26,029.00	1	1726029.00
	Total Rs.		**5622862.80**

The total supply to the public sector in 1991-92 was Rs.5622862.80 i.e. around 56 lakhs while the lowest estimate we had for the private sector for 1991-92 was 21.28 crores (Rs. 87 per capita).

3.2 - Range of Drugs Supplied

The nine PHCs were supplied on an average of 42 generic drugs each (range - 27 to 50) in 171 formulations and dosage forms like combination drugs, tablets, syrups, injections in various dosages.

Table 1

Availability of Drugs at 9 PHCs and 3 Rural Hospitals in Satara District. (1990-92)

Sr. No.	Type of Availability	PHCs		RHs	
		No. of Drugs	As % of total no. of drugs	No. of Drugs	As % of total no. of drugs
1.	AA - Always Available	0	0	2	1.25%
2.	R - Regular (available 76 to 99% of days)	4	2.68%	18	11.32%
3.	I - Irregular (available 51 to 75% of days)	10	6.71%	26	16.35%
4.	VI - Very Irregular (available 25 to 49% of days)	45	30.02%	60	37.73%
5.	EN - Effectively Not available (available 1 to 25% of days)	81	54.36%	51	32.07%
6.	NA - Not Available through the year	9	6.04%	2	1.25%
Total		**149**	**100%**	**159**	**100%**

Note : The data excludes anti-TB drugs and very marginal supplies.

The corresponding average figures for the three Rural Hospitals were - 35 generic drugs in 189 formulations. The Cottage and Civil Hospital were supplied with 129 and 151 generic drugs respectively in a large number of formulations.

3.3 - Regularity of Availability

The above figures denote only the total number of drugs supplied over a period of one year. It is also quite important to study the availability of drugs on a day to day basis. It was found that in those nine PHCs, only 14 out of 149 formulations (9.4%) were available for more than half the days of the year. In case of the three Rural Hospitals, 46 out of 159 formulations (29%) were available for more than half the days. Thus there are continuous, gross shortages at PHCs and RHs of even these Essential Drugs. Some of the details of availability are given in table No.1.

Conclusion : The drug-supply to the Public Health Facilities in Satara District is too less, less than 3 per cent of the drug-supply to the private sector. There are continuous, gross shortages of even commonly required medicines in the PHCs and the Rural Hospitals.

❑

PART II

USE OF PHARMACEUTICALS IN SATARA DISTRICT

Objectives

The overall aim of this second phase of this study was to study the use of pharmaceuticals in Satara district. In pursuance of this overall aim, the following specific objectives were delineated.

A) To study the prescriptions of doctors in public and private sector in order to assess their rationality ; the extent of the use of unnecessary, irrational, hazardous drugs and unnecessary injections. To correlate these aspects of prescriptions with the educational status of doctors, and the relevant socio-economic factors.

B) To study the factors affecting prescription behaviour of doctors, viz the Continuing Medical Education of doctors, the extent of competition amongst doctors; the marketing practices of the drug-companies and drug-stores etc.

C) To assess the knowledge status of - nurses in PHCs about the drugs they commonly use and thereby to study indirectly the use of drugs by such nurses.

D) To study the extent and nature of sale of prescription-drugs (schedule drugs) which are sold over the counter (OTC) without prescription.

E) To estimate the wastage in both public and private sector on account of use of irrational drugs by doctors.

F) To study the extent of expenses incurred by patients on account of "private - prescriptions" given by doctors in the Public Health Facilities. (PHFs).

G) To study the morbidity pattern in PHC-OPD (Out-Patient -Department) and to estimate the average drug requirement and drug budget of PHCs if all the cases coming to the PHC-OPD were to be adequately and rationally treated. To compare this need with the actual supply of drugs to PHCs.

Methodology

The methodology for each of the sub-components of this study was tailored according to the objectives and has been described at the beginning of each of the corresponding subsection of this report. The overall sampling frame has been described in the section-A i.e. Prescription-Analysis. The specific methodologies as given in different sections are to be seen in the context of this sample frame.

A - PRESCRIPTION - ANALYSIS

It is widely believed by critics that doctors' prescriptions in India are irrational to a large extent, leading to a lot of financial wastage. However, barring one exception, there are no systematic studies in India which have analysed a representative sample of doctors' prescriptions in relation to the diseases for which they are given. The current study has conducted such an analysis of 1944 prescriptions collected in 59 visits to Out - Patient Clinics of 30 public health facilities and of 1638 prescriptions from 62 visits to 19 private clinics from different parts of Satara district.

A - 1 : Objectives

To study the prescriptions of doctors in Satara district in public and private sectors, in order to assess the rationality of these prescriptions and the extent of use of unnecessary, irrational, hazardous drugs, and unnecessary injections.

To co-relate these aspects of prescription-behaviour with the educational status of doctors, their being in the private or public sector and the geographic situation of prescribing doctors (urban or rural area, developed or backward area).

A-2. : Materials and Methods

A-2.1 : Selection of Public Health Facilities

To get a representative sample, the Satara district was divided into three zones - backward, average and developed zone as in the first part of the study. Atleast five Primary Health Centres and one Rural Hospital from each of these zones, (25 out of 69 PHCs in 1991-92 and 3 out of 10 RHs in the district,) the only functioning Cottage Hospital (out of two) and the District Civil Hospital were selected for the study through purposive sampling, a total of 30 Public Health Facilities (PHFs).

A-2.2 : Selection of Private Clinics

For the study of private sector, doctors from each of the following educational backgrounds were

chosen from each of the three zones. Post-graduate, MBBS, non-allopathic degree (Ayurvedic or Homeopathic - both types as a rule prescribe allopathic medicines) and Registered Medical Practitioner (who doesn't have any recognised degree as such).

Private Practitioners were generally selected from the same village or town from where doctors from public sector were chosen so that comparison between the two becomes more meaningful.

A-2.3 : Prospective Data Gathering

To record all drugs given to the patient, the data were collected prospectively by posting pharmacist- investigators for a day in each of the clinics to record both types of drugs - those given in the dispensary and those prescribed for buying from a medical shop for first 30-35 cases.

A-2.4 : Rationality Indicators

Selection of appropriate indicators for assessing rationality of prescriptions is an important issue. We chose the following rationality/ irrationality/indicators -

A-2.4.1) Average number of drugs prescribed and percentage of prescriptions containing more than 3 drugs.

A-2.4.2) Percentage of prescriptions Containing -

a) irrational drug/s
b) unnecessary drug/s
c) hazardous drug/s
d) unnecessary injection/s

A-2.4.3) Scores Obtained by Prescriptions -

The above indicators study only specific aspects of prescriptions. An indicator is necessary which would study the prescription as a whole. Such an indicator viz. - marks obtained by each prescription as compared to a possible maximum of 30 assigned marks per prescription, was developed for this study. For this purpose, Standard Drug Treatment Regimens (SDTRs) for all the 92 commonly found diseases in these prescriptions and 16 Prescription Analysis Guidelines (PAGs) divided into 4 categories were developed. Marks were given to each prescription on the basis of these SDTRs and PAGs. Prescriptions were grouped in three slots - rational (25 to 30 marks), semi-rational (15 to 24 marks), irrational (upto 14 marks).

A-3 : Results

A-3.1 : Rationality-Indicators

The data were inputted and analysed with the help of the LOTUS - system. 2 sample t test, chi-square test and F tests were carried out to test statistical significance. The important, summarized results of prescription analysis are as follows - (For details, please see Table No.2). In general, the level of rationality of prescriptions in Satara district is quite low.

1> The **average score per prescription** is very low

The proportion of Rational Prescriptions is low and of irrational prescriptions high in all types of doctors in spite of liberal guidelines used for analysis. The proportion of rational prescriptions and the average score per prescription rises with the **educational qualification** of the doctor. Though the overall score of consultants (post graduate doctors) is slightly better, they tend to use more unnecessary drugs.

2> A very high proportion of prescriptions of all types of doctors contain **irrational/unnecessary/ hazardous drugs or unnecessary injections** or more than 3 drugs.

3> **Public sector** prescriptions are more rational than **private prescriptions**. However, proportion of irrational injections in the public sector is slightly higher than in the private sector.

Most of the differences in performance of different types of doctors in the level of rationality as assessed by different rationality indicators, were **statistically highly significant.**

A-3.2 : Other Observations

A-3.2.1 : Average score for Most Common Diseases :

Fourteen most common diseases who's combined share in the total morbidity is more than 60% (61.05%) were listed. The grading of prescriptions for these 14 diseases was as follows :

Rational - (25 to 30 marks) - Nil
Semirational (15 to 24 marks) - 6 diseases
Irrational (upto 14 marks) - 8 diseases

A-3.2.2. : Diseases with Irrational Prescriptions Diseases whos share in the morbidity load at OPD is more than 1% and who have received less than 15 marks; i.e. whos

Table - 2

Prescription Analysis of Doctors in Satara District

Sector-wise, Area-wise and Education-wise Comparison

Sector	No. of visits to Clinics	No. of prescriptions	No. of drugs per RX	No. of Prescriptions containing					Grading of prescriptions			Avg. Score per RX (out of of 30)
				More than 3 Drugs	Irrational Drug	Hazardous Drug	Unnecessary Injection	Unnecessary Drug	Rational (R)	Semi rational (S)	Irrational (I)	
Total Sector (%)	121	3582 (100)	2.8	1767 (49.3)	680 (19)	376 (10.5)	851 (23.8)	1698 (47.4)	651 (18.2)	1327 (37.0)	1604 (44.8)	14.22
Total Public Sec. (%)	59	1944 (100)	2.8	871 (44.8)	107 (5.5)	129 (6.6)	485 (24.9)	828 (42.6)	424 (21.8)	752 (38.7)	768 (39.5)	16.14
Rural Public (%)	40	1234 (100)	2.6	521 (42.2)	73 (5.9)	69 (5.6)	262 (21.4)	456 (37)	264 (21.4)	476 (38.6)	494 (40.0)	16.22
Urban Public (%)	7	271 (100)	2.8	141 (52)	6 (2.2)	11 (4.1)	67 (24.7)	133 (49.1)	86 (31.7)	108 (39.9)	77 (28.4)	16.34
Small Towns (%)	12	439 (100)	3.0	209 (47.6)	28 (6.4)	49 (11.2)	156 (35.5)	239 (54.4)	74 (16.9)	168 (38.3)	197 (44.9)	15.76
Total Private Sec. (%)	62	1638 (100)	3.0	896 (54.7)	573 (35)	247 (15.1)	366 (22.3)	870 (53.1)	227 (13.85)	575 (35.10)	836 (51)	12.52
Rural Private (%)	14	371 (100)	2.9	186 (50.1)	103 (27.8)	44 (11.9)	80 (21.6)	148 (39.9)	56 (15.1)	138 (37.2)	177 (47.7)	14.42
Urban Private (%)	27	726 (100)	2.9	437 (60.2)	265 (36.5)	109 (15)	116 (16)	411 (57)	94 (12.9)	256 (35.3)	376 (51.8)	12.55
Small Towns (%)	21	541 (100)	3.3	273 (150.5)	205 (37.9)	94 (17.4)	170 (31.4)	311 (57.5)	77 (14.2)	181 (33.5)	283 (52.3)	11.36
All Consultants (%)	16	504 (100)	3.1	290 (57.5)	166 (32.9)	25 (5.0)	29 (5.8)	252 (50)	126 (25.0)	209 (41.5)	169 (33.5)	15.64
Public (%)	3	144 (100)	3	67 (46.5)	4 (2.8)	6 (4.2)	15 (10.4)	59 (41)	60 (41.7)	55 (38.2)	29 (20.1)	19.65
Private (%)	13	360 (100)	3.0	223 (61.9)	162 (45)	19 (5.3)	14 (3.9)	193 (53.6)	68 (18.9)	152 (42.2)	140 (38.9)	14.71
ALL MBBS (%)	72	2238 (100)	3	1055 (47.1)	266 (11.9)	176 (7.9)	572 (25.6)	1029 (46)	437 (19.5)	851 (38.0)	950 (42.5)	15.34
Public (%)	51	1624 (100)	2.7	737 (45.4)	91 (5.6)	101 96.2)	415 (25.6)	694 (42.7)	342 (21.0)	638 (39.3)	644 (39.7)	16.30
Private (%)	21	614 (100)	3.0	318 (51.8)	175 (28.5)	75 (12.2)	157 (25.6)	335 (54.6)	95 (15.5)	213 (34.7)	306 (49.8)	13.03
All Non-Allopaths (%)	28	719 (100)	3.1	355 (49.4)	214 (29.8)	138 (19.2)	199 (27.7)	355 (19.4)	77 (10.7)	224 (31.2)	418 (58.1)	11.28
All RMPs (%)	5	121 (100)	2.2	67 (55.4)	34 (28.1)	37 (30.6)	51 (42.1)	62 (51.2)	11 (9.1)	43 (35.5)	67 (55.4)	10.09

prescriptions are irrational have also been listed. Obviously special attentions will have to be given to the drug-treatment of these disease in Continuing Medical Education of doctors.

A-3.2.3. : Grossly Irrational Prescriptions

We came across many prescriptions which were grossly irrational. They contained either a totally wrong selection of the main drug or use of contraindicated drug or two or three analgesics or haematinics etc. We have reproduced 25 such grossly irrational prescriptions encountered the collection of prescriptions during Winter 1993. This is only an illustrative list. Many more such examples were found.

Surprisingly, all types of doctors from RMPs in a small village to post-graduate doctors in large town were found to be writing grossly irrational prescriptions.

B) FACTORS INFLUENCING PRESCRIPTION-BEHAVIOUR OF DOCTORS

Different factors other than the needs of rational therapeutics influence doctors' prescriptions - level of Continuing Medical Education (CME) of doctors, the marketing strategy of the drug companies, extent and type of competition amongst doctors, availability of medicines, socio-economic background of patients etc. In this exploratory exercise, we studied some of the factors that in their own perception, influence doctor's prescriptions in Satara district.

B-1 Materials and Methods

This study is in two parts. In **Part-I,** we explored the gambit of factors that contribute to doctors' irrational prescribing. In **Part II**, we used the results of analysis of doctors' prescriptions (from section A of the study), to compare their rationality score with the socio-economic factors influencing their prescriptions.

Ist part - Structured questionnaire plus focussed interview

As an entry point, we administered a small two page pretested structured questionnaire which sought information regarding qualifications of the doctor, his/her sources of continuing medical education, the number of medical representatives that visited him in a week, his/her views on patients expectations, his/her opinions on drugs available in the open market.

Focussed interviews were conducted with those doctors who were willing to give information beyond this questionnaire. The guidelines to the focussed interview included various probes for the investigators to find out more about the sources that public and private doctors had to Continuing Medical Education; marketing practices of drug-companies and drug-stores, availability of drugs, extent of competition.

IInd part - Questionnaire

To correlate the rationality score of doctors with certain socio-economic factors, we used a revised version of the earlier questionnaire which we first pretested. This questionnaire was brief in asking the doctors' opinions about medical companies and their practices on field, additional qualifications of the prescribers (in terms of even practical knowledge such as hospital training etc), number of medical stores in the area, number of medical representatives that visited, the peer pressure on the doctors, number of patients etc.

Sampling

We randomly picked five Primary Health Centres (PHCs) in the each of the three zones as in the rest of this study. One medical Officer each from these 15 PHCs and one or two private doctors operating in the same village or nearby villages were interviewed.

B-2 : Results

In **Part II** study, we had proposed to compare rationality scores with the socio-economic surroundings of the doctor. The rationality scores however revealed that very little co-relation was possible as majority of doctors in our sub-sample had a very low rationality score.

The Qualitative Results were as follows

B-2.1) CME in the private sector is almost entirely left to the discretion of the individual doctors and only 12.6% actually subscribed to periodicals other than those published by drug companies.

In the public sector, the department of health services conducted trainings at frequent intervals for Medical Officers, though these mainly stressed and centered around the implementation of National Programmes.

B-2.2) The drug company propaganda, through its printed literature (ie. pamphlets and periodicals), and Medical Representatives forms the most important source of 'Continuing Medical Education' for doctors. Though this is promotional literature and therefore biased, it receives the sanction of more than 68.1% of private and 50% of public doctors as being a source of education.

B-2.3) Cost influenced prescribing patterns in a significant way. Rising costs of drugs have resulted in doctors changing the manner in which they dispense drugs. Though prescribing an expensive drug carries with it a higher status; doctors are cautious that the cost of the drug is not out of the purview of the patient as it may work negatively in the case of a poor patient.

Rising costs of drugs was also making it difficult for a doctor to dispense drugs as well as charge a fee. Some doctors therefore resorted to dispensing less and prescribing more.

B-2.4) Low availability of drugs at the PHC meant that MOs were compelled to prescribe drugs from the open market. However, MOs also looked at the socio-economic profile of the patient prescribing 'outside' drugs for 'important' patients etc.

B-2.5) Increased crowding of doctors has led to private doctors seeking ways to draw and keep patients leading to a change in prescribing habits. Administration of placebos, in the form of unnecessary injections, drugs, the prescribing of more expensive drugs to appease the patients' notion that the more expensive medicine the better it is : are all strategies to keep the clientele with them.

C) KNOWLEDGE OF PHC NURSES ABOUT COMMON DRUGS

Answers given by 24 nurses in 9 PHCs and their sub-centres to a questionnaire about 10 drugs they use, were evaluated by assigning marks to answers, by comparing the answers with the standard answers prepared for this purpose. The average number of marks scored by these nurses was 49.88%. The breakdown was as follows - marks for indications of drugs 68.17%, dose 75.19%, precautions 28.96%. This shows that nurses in PHCs, need continuing education about the drugs they use, especially as regards precautions to be taken while using drugs.

ILLEGAL SALE OF OTC DRUGS

In the study of sale of drugs in a day in a drug-shop in Satara, it was found that all types of drugs were available OTC without doctor's prescription. OTC sales in a day (Rs.497.99) accounted for 11.23% of the total drug sales (Rs.4436) in a day in that shop.

E)FINANCIAL WASTAGE DUE TO IRRATIONAL PRESCRIPTIONS

In part A of this study, we confirmed the earlier impressions of many critical observers that a substantial proportion of doctors' prescriptions contained irrational and/or unnecessary drugs. Such irrational prescriptions means unnecessary additional expenses on drug-treatment for the patient or the payer of the drug-bills. We are unaware of any systematic published Indian study which calculates this financial wastage due to irrational prescriptions. We therefore, decided to estimate the financial wastage/loss to the patients due to irrational prescriptions.

Out of the 1080 and 810 prescriptions collected in summer 1993 from public and private sector respectively, 10% sub-sample was picked up by systematic random sampling.

This sub-sample was subjected to cost-analysis. Per day cost of drug treatment as per those prescriptions by doctors, minus the per day cost as per Standard Drug Treatment Regimens (SDTRs) gave us the financial loss to the patients due to irrational prescriptions per day of drug treatment. It will be seen from the table E-1 that due to irrational prescriptions, a whopping 63.6% of money spent on drugs is a waste! The proportion is much higher in case of private sector (69.2%) as compared to that in the public sector (55.4%). Based on available estimates of rate of morbidity in India, in the community, and the 1991-92 OPD attendance data in PHFs in Satara district, this wastage of Rs. 4.76 and Rs. 2.08 in private and public sector respectively per day, per prescription, if projected at Satara district population, (1991) amounts to Rs. 17.70 crores. This startling finding

buttresses the argument that in India today, people do not get adequate drug treatment, not so much because we are poor, but mainly because a lot of money is wasted on irrational prescriptions.

Table No. 3

Monetary Wastage Due to Irrational Prescriptions

Sr. No		Private	Public	Total
1.	No. of Prescriptions	68	84	152.
2.	Cost of doctors' prescriptions per day (in Rs.)	467.6	315.7	783.29
3.	Cost as per S.D.T.R per day (in Rs.)	144.09	140.82	284.91
4.	Wastage due to irrational prescriptions per day (in Rs.)	323.53	174.85	498.38
5.	Wastage as % age of money spent by the patient (Sr.No. 4/2 x 100)	69.19	55.39	63.63
6.	Wastage per prescription per day. (Sr. No. 4/1)	4.76	2.08	3.28

F) PROPORTION OF PRIVATE PRESCRIPTIONS IN PUBLIC HEALTH FACILITIES

Patients visiting Public Health Facilities (PHFs) should get all the drugs required for the treatment of their ailments, free of charge from the PHFs. But there is a common complaint, as well as our own observation during this study, that doctors in PHFs ask patients to buy some of the medicines by giving them "outside - prescriptions". This is because of chronic shortage of medicines in PHFs. We decided to estimate the amount spent by patients on such "outside - prescriptions" in a sub-sample of prescriptions in our study. To our knowledge, there are no published estimates about such "outside - prescriptions" given in PHFs in India.

F-1 : Materials and Methods

Out of the 561 prescriptions copied from PHFs during winter 1993, a 20% sub-sample was selected by systematic random sampling. In case of the 145 prescriptions thus selected, the drugs prescribed through the "outside - prescriptions" and the "dispensed drugs" were listed separately. The cost of both types of drugs (prescribed and dispensed) was calculated as per retail prices as given in the 1992-93 edition of Indian Pharmaceutical Guide (IPG).

In the same way cost-analysis was also done separately for prescriptions of 7 PHFs located in cities and small towns (as listed in the District Census 1981) out of total of 19 PHFs studied in winter 1993. These urban places have one or more drug-stores and hence doctors in PHFs in these places tend to write outside-prescription more often.

F-2 : Results

The cost of 'private prescriptions' in Public Health Facilities in case of these 145 randomly selected O.P.D. cases in Satara district in a day in winter 1993, was 15.43% of the cost of drugs dispensed from these 19 clinics to these 145 patients. In absolute terms, the cost of these privately prescribed drugs if distributed over all these 145 patients, comes to only Rs.0.82 per patient (It may be noted that out of these 145 patients, many were not given any private prescription).

In the bigger and small towns also, the cost of privately purchased drugs as a proportion of cost of dispensed drugs on an average was 15.64%. It ranges a great deal from zero to 221.5%. The average cost of privately purchased drug, per prescription in these 7 PHFs was found to be Rs. 7.97, which is much higher than that found for all centres. (urban and rural together).

It appears that the overall proportion of privately prescribed drugs in PHFs in Satara district is not high but is sizeable. In some Public Health Facilities in big and small towns, where it ranges considerably, from zero to a very high of 221.5%.

Patients coming to PHFs should get all the drugs needed for their ailments and they should not be required to buy medicines at all. The present average of 15% of drugs required to be bought by patients is not high but certainly undesirable and should be zero.

G) NEED VERSUS SUPPLY OF DRUGS

There are no systematic estimates available of drug-needs of PHCs and the total drug-needs of a district. Since such estimate is required for any

rational drug-planning, we made such estimate on the basis of available data in Satara and morbidity rates in India. This drug-need has been compared with the drug-supply to Satara-district

G-1) Materials and Methods

G-1.1) Drug-need of Patients Coming to PHC

Out of the 9 PHCs chosen in Part I of our study for study of Supply of drugs, a representative sample of six PHCs was selected to estimate the drug needs so that these drug-needs could be compared with the actual supply to these six PHCs.

A five percent systematic random sample of OPD case papers from these six PHCs was taken to find out the frequencies of various diseases reported. These frequencies were multiplied by the drug-cost of treatment per disease, as per SDTR as worked out in Annexure A-I. This gave the drug-costs for patients coming to these PHC-OPDs for curative/symptomatic care. This was compared with the drug-supply to these six PHCs.

G.1.2 : Drug-Need of All Citizens in Satara District

Patients coming to PHC-OPD are only a small fraction of the total ill-persons in the community. We therefore estimated the drug-need of all ill-persons in the community and further drug-needs for preventive care for all needy persons in Satara district.

G.1.2.1 : Drug-Need for Curative Care at OPD level

The community based comprehensive morbidity data required for this estimation are not available for Satara district. We therefore used the available estimates of rate of morbidity for Indian community to arrive at a total morbidity load in Satara district, under the assumption that rate of morbidity in Satara district (an average district in Maharashtra) would not be much different than the All-India average. This morbidity load multiplied by the average drug-cost per case (Rs. 11.74) as per SDTR, gave the total drug need for OPD level-care.

In the exercise G.1.1, we had excluded drug-cost of treatment of leprosy and tuberculosis, since the routine case-paper records at PHCs exclude TB and leprosy cases. (These data are maintained separately). For estimating the total drug-needs of the Satara district, we therefore had to add the estimated total drug-cost for all TB and leprosy patients in Satara. For this purpose, we had to again use estimated rate of morbidity for India/Maharashtra for these two diseases. This morbidity load was multiplied by cost per case as per SDTR for TB and leprosy to get total drug-cost for all TB and leprosy cases.

G:1.2.2 : Drug-needs for All Indoor Cases

The drug-expenditure for indoor cases in Civil and Cottage Hospital accounts for most of the indoor drug expenditure in the public sector. We made a liberal assumption that the indoor-drug-expenditure in the private sector is ten times the indoor drug expenditure in these two hospitals, as given in the Performance Budget (1993-94) of Govt. of Maharashtra, and on that basis estimated the drug-cost of all indoor cases in Satara district.

G1.2.3 : Drug Needs for Preventive Care

These needs are mostly for vaccination of children and for Ante Natal Cases (tetanus immunization plus iron-calcium supplementation) in short, drug-cost for total coverage in MCH-programmes. Since the age-wise break-up of Satara-population is not available, we again used the All-India figures for percentage-wise share of various age-groups to get total number of children in age-groups - 0 to 1 yr, 1 to 2 yrs, 2 to 3 yrs, and 5 to 6 yrs and of pregnant women in Satara district. This number, multiplied by the cost of preventive medication per person as per prices of Haffkine BPCL (the public sector concern, which supplies vaccines to Maharashtra Govt.) gave us the total cost of preventive medication in Satara district.

G-2 : Results

G-2.1 : The drug-need for OPD-level curative/ symptomatic care for the six PHCs under study, was an average of Rs. 67418 per PHC, Rs. 11.68 per case. (This excludes TB and leprosy cases). The drug-supply for curative, symptomatic care for these six PHCs, as found in part-I of this study was Rs. 37134 per PHC. Thus there was a short fall of Rs. 30284 per PHC, which is 8.34% of the recurring annual expenditure of Rs. 0.363 million per PHC in 1991-92. Thus, if the recurring annual expenditure

for PHCs is increased by a mere 8.34% to increase drug supply to PHCs, and if all the drug-supply is used rationally, all patients coming to PHC-OPD can be adequately treated.

G.2.2 : Total Drug Needs of Satara District

As revealed by the exercise outlined in section G1.2, the total drug-needs of Satara district in 1991-92 would be as follows :

i. For curative care for all patients at OPD level excluding TB and Leprosy	Rs. 151.02 m.
ii. For all cases of TB and Leprosy	Rs. 29.73 m.
iii. For all indoor cases	Rs. 17.82 m.
iv. For total coverage in preventive medication in MCH Programme	Rs. 6.86 m.
Total	Rs.205.43 m.

The total drug-supply in Satara district was a minimum of Rs. 212.8 m. in private sector and Rs. 5.6 m. in public sector. Thus, this supply is more than sufficient to meet all the drug-needs of the Satara-district. Thus, the drug-needs of Satara-district are not being met today, not because of lack of resources, but because of wastage through irrational use.

CONCLUSIONS

The overall conclusions of this study are :

1> The drug-supply to the public sector in Satara District was a mere Rs.5.6 million, as compared to the most minimum, reliable estimate of a drug sale of Rs.212.8 m. in the private sector during 1991-92. The drug supply especially to PHCs and RHs suffers from chronic gross shortages and haphazardousness.

2> The overall quality of prescriptions of doctors both in public and private sector is low. There is very high proportion of use of unnecessary, irrational, hazardous drugs and unnecessary injections especially in the private sector. Public Sector prescriptions are more rational than private sector prescriptions. Proportion of rational prescriptions increases with educational qualification.

3> There is very little of proper Continuing Medical Education of doctors. This along with the influence of the Medical Representatives, increasing prices drugs and competition amongst doctors influence the prescriptions of doctors in the private sector, whereas in the public sector, the chronic shortage of drugs affects prescriptions, apart from lack of proper CME.

4> Knowledge of PHC - nurses about the drugs they use is satisfactory as regards indications and dosage but quite unsatisfactory as regards precautions and side-effects.

5> Due to irrational prescriptions, 69% and 55% of the money spent on prescriptions in the private and public sector, respectively, is a waste, with an average of 63%. Projected to the Satara-district level, this wastage amounts to Rs.17.7 crores out of the total drug supply of Rs.22 crores.

6> Patients visiting government clinics in Satara district have to buy 15% of the drugs prescribed to them, instead of getting all drugs free.

7> If all the patients coming to the six PHC under study, were to be adequately and rationally treated, there would be a drug-short fall of Rs.30284 per PHC. This shortfall can be met by a mere 8.34% increase in the annual recurring expenditure of Rs. 0.363 million per PHC.

8> If all the patients in Satara district were to be adequately and rationally treated and if all children and women were to be fully covered in the MCH Programme in 1991-92, the drug- expenditure would have been Rs.20.61 crores, compared to the total drug expenditure of Rs.21.84 crores in Satara district. It is thus, not lack of resources, but its irrational, wasteful use, which is responsible for the unmet drug needs of the Satara district.

The overall drug situation in Satara district is that of 'Poverty Amidst Plenty' - poor drug supply to the public sector, poor quality of prescriptions, a lot of wastage of the adequate drug-expenditure incurred by the people in Satara district.

❑

SUPPLY OF PHARMACEUTICALS TO SATARA DISTRICT

1. INTRODUCTION

Shortages of drugs-supply to the public sector is an often mentioned reason for ineffective functioning and low utilization of its services. An earlier FRCH study of PHCs (Jesani, unpublished, 1990) in Maharashtra found that 43% of capsules and tablets, and 27% of injections were combination drugs; while 21.4% of capsules/tablets and 13.3% of injections were irrational/useless or hazardous. We are unaware of any study which has studied in depth the supply of drugs to the public sector in a district. We therefore embarked on such a study. We also decided to find out the total volume of sale of drugs in the same district.

2. OBJECTIVES

1. To study the dynamics of supply of pharmaceuticals to Public Health Facilities in a district.

2. To estimate total and category wise cost of drugs supplied to these centres in a financial year.

3. To understand the way drugs are managed, future needs estimated and indenting done for receiving supply at these centres.

4. To examine rationality of drugs available at these centres.

5. To make recommendations for improvement in areas where deficiencies are found.

6. To find out the total volume of sales and medicines in the same district.

3. MATERIALS AND METHODS

3.1 Sampling

In this study, we selected government health care centres from Primary Health Centres to the Civil Hospital in one district of Maharashtra. This was done to cover first and second level referral health care centres. The sub-centres of the PHC were not taken up for the study due to logistical problems. Sampling of the units were done at several levels using different criteria.

3.1.1 Selection of District

For selecting the district, we took into consideration its socioeconomic development, size of the civil hospital (number and beds), existence of cottage hospital, expenditure on drugs and logistical convenience for undertaking a study there.

For level of socioeconomic development, the Centre for Monitoring Indian Economy's Index for district socioeconomic development was taken to classify districts in Maharashtra as Highly Developed, Averagely Developed and Underdeveloped. The districts falling in the averagely developed class were selected for application of other criteria. From the Performance Budget of the Govt of Maharashtra 1990-91, information on the sanctioned beds in the Civil Hospital and expenditure for drugs were obtained for the averagely developed districts. In the final selection, the logistical convenience to study the district from Pune city where our research staff was located, was kept in mind.

Satara District in Western part of Maharashtra fulfilled the above criteria better than other districts. Table 1 shows its characteristics.

TABLE - 1

Criteria for Selection of The District

	Maharashtra Average	Satara
1. The CMIE index (All India = 100)	163	93
2. Average no of beds in non teaching CHs (1990-91)	239	235
3. Average OPD attendance per day (CHs) (1990-91)	631	350
4. Average daily expenditure on drugs per OPD patient (Civil Hospital) (1990-91) (Rs.) -	4.47	7
5. Average no of Indoor pts. per day (CHs) (1990-91)	251	233
6. Average daily expenditure on drugs per Indoor patient (CHs) (1990-91) (Rs) -	22	20
7. Distance from Pune Kms	—	70

From the Table 1 it is clear that the various relevant indicators from Satara district are near the all-Maharashtra average for these indicators. Further, the district is located within a comfortable distance from the Pune City.

3.1.2 Selection of Cottage Hospital

There are two Cottage Hospitals in Satara district out of which the one located in the underdeveloped Eastern region of the district is only for the namesake, as it is not fully functional and has a very low OPD attendance. Inclusion of such an unit would have defeated the very purpose of the study and so it was not considered for selection. The second Cottage Hospital is in Karad town and was selected for the study. It had the following features in 1990-91 - average daily OPD attendance of 323, average daily expenditure on drugs of Rs. 1.09 per OPD patient, average daily Indoor patients 45 and average daily expenditure on drugs per Indoor patient Rs. 7.37.

3.1.3 Selection of Community Health Centres/ Rural Hospitals (CHs/RHs) and Primary Health Centres (PHCs)

Unfortunately no CMIE or any other indicator of socioeconomic development for the Tehsil blocks are available. However, the 1990-91 annual report at the Zilla Parishad gave us a stratification of Tehsils that broadly corresponds to the geographic and partly socioeconomic characteristics of the people in the district. The **three zones** are :

a) The Western Part of the district falling along the secondary range, is hilly and considered to be **averagely developed.**

b) The very fertile land region which lies along the banks of river Krishna. Economically this is considered to be highly **developed** region of the district.

c) The Eastern part of the district is drought prone and has low quality agricultural land and is considered **backward** zone.

In order to give representation to three different geographic and socioeconomic zones of the district, **one Tehsil block from each zone** was randomly selected. Thus, three Tehsils, **Khatav** from the Eastern Zone, **Wai** from the Western Hilly zone and **Karad** from the Developed region were selected for the study. Their mean annual OPD attendance during 1990-91 is given in table no. 2.

One **RH** each, from each of the above zones from Khatav, Wai and Koregaon Tehsils was selected using the annual OPD attendance as a selection criterion. (For developed zone, RH from Koregaon and not Karad Tehsil was selected) Amongst RHs having above average OPD attendance, 3 RHs were randomly selected. This was easy as the Tehsil normally has one or two RH. The RH selected were Vaduj (Khatav Tehsil), Pimpode (Koregaon Tehsil) and Wai (Wai Tehsil).

For selection of **PHCs** we again used the same criterion, of the annual OPD attendance. From each Tehsil, two PHCs were to be selected. However, since we realised that our overall sample was favouring the developed region (Civil Hospital, Cottage Hospital and one RH are located in the developed region), we decided to have one more PHC from the underdeveloped region i.e. three instead of two. This was a fortunate decision as later we found that in one of the three selected PHCs from Khatav Tehsil, there were scanty data on the drug indenting. Thus, one PHC with above average OPD attendance and another with below average OPD attendance for the Tehsil was selected from the Khatav Tehsil. The PHCs thus selected were Khatav, Aundh, Mayani (Khatav Tehsil), Indoli, Undale (Karad Tehsil), Bhuinj, Bavdhan (Wai Tehsil). Where the RH was situated along with a PHC, the PHC was also included in the study. Therefore the total number of the PHCs selected for the study was nine.

TABLE NO. 2

Characteristics of the PHCs Selected

Tehsil/PHC	Annual OPD Attendance
(A) Karad Tehsil (Developed) Total 11 PHCs	8,031 (Mean)
1. Indoli	11,250
2. Undale	05,272
(B) Wai Tehsil (Average) Total 05 PHCS	6,101 (Mean)
3. Bhuinj	10,728
4. Bavdhan	03,184
(C) Khatav Tehsil (Underdeveloped) Total 08 PHCs	8,060 (Mean)
5. Khatav	03,600
6. Aundh	08,068
7. Mayani	03,943
(D) PHCs alongwith RH	
8. Pimpode (developed region)	2,023
9. Vaduj (backward region)	612

3.2 Data Collection and Analysis

The objective of data collection in this first part of the study was to understand the drug procurement, unit level management and gross utilization systems. For this purpose, two preliminary visits to the district level health officials and the doctors in charge of all the selected units were made. Discussions were held with the district level doctors and pharmacists. The district level drug store of the DHO's office was also visited.

Each unit was then sent two schedules, in tabular form with a request to the unit doctor in charge to get them filled up by the concerned compounder or pharmacist. In the schedules, we had requested them to provide, on each drug, the information on number of times and quantity supplied, source of supply, amount of drug indented, the balance stocks of each drug, at the date of supply and balance as on 31st March - and so on. The response from most of the units to these schedules was very poor.

Therefore, we decided to go ourselves and collect the information. The information collection at most of the units turned out to be a difficult task not because the persons concerned were non-cooperative but because of the way information is maintained. Only at those places where the pharmacist had taken personal care in keeping systematic information, data collection was easier. As a result we spent literally hundreds of hours at each PHC and RH sorting out dusty and haphazardly kept records to get record of each amount and date of supply, indent and utilisation of every drug ever supplied during the period of study. Later additional rounds were made to confirm data procured as well as to fill up lacunae. Even here drug data relating to TB, Malaria and Leprosy shows lacunae due to erratic record-keeping.

Then the list of drugs was categorized according to the WHO classification and the drug supply utilisation data were rearranged as per this classification. This was also a very time consuming and back-breaking work.

Cost of Drugs

The price paid while purchasing drugs for the each unit, to our dismay, was found to vary from company to company, even in the rate contract system. It was impossible to go through the price of each lot of drug and then to trace from that lot, the quantity supplied to the study unit. We therefore selected one rate contract reference price for each drug supplied to the units and where no reference price was available, we chose the lowest market price of the drug. The selection of the reference rate contract price of the drug was done randomly while going through the drug bills at the district centre. Vaccines supplied under the immunization programme, as well as contraceptives under the family planning programme are received by the State and supplied to the district totally free of cost. Therefore, it was not possible to quantify this supply in rupee terms.

The data for drug-supply to Public Health Facility (PHFs) were arranged as per WHO essential drug list.

3.3 Drug-Supply to the Private Sector

To estimate the cost of drug supply in the private sector, we first explored the possibilities of finding out the sales of all drug companies operating in the district. Discussions with the Medical Representatives, Medical Store owners, Distributors and other informed persons led us to conclude that this was almost impossible as companies were reluctant to reveal their sales figures for reasons of competition and income-tax implications. The same was the case with distributor-wholesalers.

To get a good estimate of the volume of drug sales in the district, we needed the total sales of all retail stores operating within the district or alternatively the 'secondary' sale figure, [that is, sale of drugs from wholesaler to the drug retailer (store)] for all wholesalers in the district. This does not take care of sales made by wholesalers outside the district (outflow) or by wholesalers operating outside the district but who supply to the district (inflow). Also local manufacturers and small drug companies sometimes supply directly to the doctors, retailers, or their wholesalers. But this was too small to notice. We have presumed that the inflow and outflow of drug supply should balance out as there was no way to procure such information

After exploring all these possibilities we chanced upon a source who had access to the audited figures for seventeen of the largest drug distributors operating in Satara, Karad and Phaltan town of Satara district. These figures for the year ending 31st March, 1993, totaled to Rs. 22.6 crores.

This source as well as the MRs and the discussions with some Medical Store owners revealed that the other distributors with turn over of less than 30 lakhs, was an additional four crores. This gives a total of Rs. 26.6 crores as drug sales

in 1992-93 in the district, through distributor networks.

This is a conservative figure. It is common knowledge that audited statements are deflated versions of actual sales and income.

If we add to this a rough estimate of (again after discussion with various people associated with the pharmaceutical industry) the sales of local drug companies, we would still have a very minimum figure of Rs. 30 crores of drugs being supplied to the district in 1992-93.

The overall estimate of Medical Representatives (MR) was much higher at 50 crores. They informed us that the secondary sales of Cipla for its anti-microbial formulation 'Norflox' was 1.10 crores a year in Satara. The sales of the Himalaya Drug Company who markets ayurvedic formulations is over Rs. 2 Lakhs per month in Satara district alone (1992).

In our discussion with drug distributors, one distributor mentioned a study done by him in 1978. His estimate of drug sales for the year 1978 was between 14 to 15 crores for the district. One of his findings was that there is a 22% growth in drug sales per year. The drug sale in Satara district 15 years after this study would thus be about Rs 42 to 45 crores.

4. RESULTS

4.1 Drug Supply to the Private Sector.

Even if we discount the anecdotal estimates and take into account only the audited sales figures of the major 17 drug distributors and the estimated sales figures of the other distributors, we come to a minimum sale estimate of Rs 26.6 crores of drugs in Satara district in 1992-93.

Though if the estimates of those associated with the drug industry such as drug store owners, are taken into account then the minimum estimate is 30 crores . If unbilled and unaccounted, (i.e. invisible in the accounting books) sales are considered, then the MR estimate of Rs 50 crores could be closer to the real picture.

4.2 Drug Supply to The Public Sector

4.2.1 Supply to the District

All drugs supplied to the Public Sector are divided into A, B, C categories of drugs. Costly drugs, antibiotics, intravenous injections and scalpel sets, fall into the A category. All 'A' category drugs are purchased and supplied by the Directorate of Health Services (DHS), Bombay. Drugs falling into the 'B' category of drugs are the analgesics, vitamins, minerals, anti-pyretics, antiseptics etc., while 'C' category largely includes dressing materials, detergents etc. For Primary Health Centres (PHCs) the District Health Officer (DHO) makes the purchase of B & C categories, while the circle (in this case Pune) supplies Rural Hospitals with B & C category drugs. The Medical Superintendent (MS) and the Civil Surgeon (CS) make the purchase for the Cottage Hospital and the Civil Hospital respectively. The B & C category of drugs are purchased at the levels of the DHO, CS and MS through 'Rate Contract' (RC) companies. The rate contract booklet consists of prices fixed by contract. The original price and company that supplies a particular drug is listed. In case the company fails to supply, then the purchases can be made from the alternative I and alternative II in that order. The difference in cost is recovered from the 'original' company's deposit placed with the DHS at the time of signing the rate contract.

This system is full of delays, irregular supply, no supply, and at times sub-standard goods are delivered. The rate-contract companies' complaint (as narrated to us by the staff at PHCs and Civil Hospitals) is that the prices of drugs have not been revised for a long time. At the time of study they had not been revised since 1987 (they have since been revised w.e.f. 1.6.94 for three years). As a result, it is not economical for the drug companies to make supplies at the same price. Where they cannot refuse, they just delay supply to the point where the public sector units resort to local purchase or make do without the drug.

Private companies even resort to malpractice as seen from the case when a certain capsule was found to contain haldi powder (narrated to us by a PHC MO). The more authentic case was demonstrated to us by another MO who showed us tubes of antiseptic cream in which only the top was filled. The rest of the tube was empty.

4.2.2 Supply to Cottage and Civil Hospital

At both these units tenders are sent out to existing companies listed under the 'rate contract' system. The Medical Superintendent (MS; Cottage Hospital) and the Civil Surgeon (CS; Civil Hospital) are permitted to sanction purchases for B and C categories of drugs from these companies. In the

cases where prices are known or fixed earlier under the rate contracts, only purchase orders are made. Such companies are bound to supply at the contract rates.

During our fieldwork we heard frequent complaints about the rate-contract system. Apparently drug companies in protest that prices had not been revised were delaying supplies, not supplying at all or supplying sub- standard drugs. This meant that when a consignment finally arrived after long delays, sometimes the drug controller certification of sub-standard meant that the drugs could not be used. At other times quality escaped notice.

4.2.3 Drug Supply Under the National Programmes

All vaccines and contraceptives under the Universal Immunisation Programme (UIP) and the Family Planning (FP) programme are supplied to the State and hence to the district free of cost. The drug cost of sterilizations under the (FP) programme is also taken care of by the Centre. That is, the cost of drugs and surgicals is reimbursed to the State Government on a per case basis. Vaccines under the immunisation programme are also supplied as per stipulated population, calculations and targets. The tuberculosis and malaria eradication programmes work in co-ordination with the PHC. The District Tuberculosis Office (DTO) and the District Malaria Office (DMO) make their supplies to the PHCs directly. The leprosy worker is posted in each PHC. He coordinates directly with the District Leprosy Centre, and supplies are made according to patients identified and treatment needed.

4.2 Supply of Drugs to PHCs

The supply of drugs to any PHC is largely dependent on the availability of drugs with the pharmacist at the DHO office. The PHC is dependent for supplies on:

a. Availability with the DHO - for the curative/ symptomatic range of drugs, as well as drugs, surgicals etc. needed for sterilization operations. The DHO has a budget within which he/she can procure drugs according to the need of his/her district. In Satara, the budget was 24 lakhs for 1990-91, intended to cover the drug needs of 69 PHCs, and 5 PHUs.

b. The Centre and then the State for vaccines etc. under the Universal Immunisation Programme (UIP), as well as for contraceptives.

c. The district offices of the malaria, tuberculosis and leprosy control programmes. These undertake and supervise their own supply of drugs according to targets prescribed.

It was found that the availability of drugs at the PHC also depended on proximity of the PHC to the District Head- quarters; or the political pressure exerted by the village people on the PHC infrastructure.

PHC - Kits

PHC-Kits are supplied by the DHS, Bombay. They are emergency kits containing essential drugs and equipment to deal with emergency situations at the PHC (e.g. road accidents). These come via the DHO, once a year, and are supplied by the State from Bombay.

Sub-Centre Kits

Essentially meant for use by the MPW (Multi-Purpose Worker), they are purchased by the DHO through tenders from rate-contract companies. Instead of distribution to sub- centres, they are often used in part or full at the PHC itself. A list of drugs available in the sub-centre kit is given in Annexure C-I of Part II.

4.2. 5 Indenting Procedure

At the PHC and RH level, demand for drugs are made through an indent presented (weekly) at the district pharmacy store. In the case of PHCs this district pharmacy store is situated at the DHO office, and for RHs at the Civil Hospital in Satara. In the discussions with PHC and RH MOs and Pharmacists, we gathered that indents are made as a matter of routine. The PHC staff do not expect that supplies would be made according to indents. It was noted that the indent slanted towards an exaggeration of need when asking for antibiotics, injections etc. Indents hardly ever included analgesics and ayurvedic drugs. Secondly the staff told us that they do not include in the indents drugs that have not been available over a long period of time. Hence a PHC indent cannot be used as an estimate of drugs needs for the PHC. This can be seen from Table No.3.

The following example also indicates this concretely. Cap. Ampicillin is not regularly available at PHCs. The data show that demand for

SUPPLY Vs INDENT

Table 3 For Selected Drugs in PHC U

Category of Drug and its number as per WHO Essential Drug List	Total amount of Sup.	No. of Sup.	PHC U Total amount indented	No. of ind.
1. Non-opoids Analgesics				
a. Aspirin 500 mg	67000	8	5000	1
b. Paracetamol	19000	10	33000	9
2. Anti-allergics				
CPM of Avil	12000	4	11000	6
3. Anti-epileptics	1000	0	0	0
4. Anti-helminthics				
a. Mebendazole	0	0	0	0
b. Di-ethyl Carb. lit. 50 mg	1500	5	14500	14
5. Anti-bacterials				
a. Ampicillin/Amoxicillin	3300	5	14500	14
b. Furazolidone	23000	13	14000	7
c. Erythromycin	300	1	0	0
d. Trimeth + Sulpha	0	0	0	0
6. Anti-amoebic				
a. Metronidazole	6000	5	3000	2
7. Hormone (Antineo)				
a. Dexamethosone/ Prednisolone	0	0	1000	1
8. Anti-anaemic				
a. Ferrous Sulphate	33700	7	-	3
b. Iron & Folic Acid	200	3	0	0
9. Hypertensive				
a. Tab. Adelphane	250	1	0	0
10. Dermatological				
a. Anti-infective	39	3	10	1
b. Benzyl benzoate	11	2	0	0
11. Antiseptics				
a. Sol. autrimide 10%	0	0	20	5
b. Liq. Dettol	2	2	16	6
c. Sol. Iodine Tincture 2%	8	4	93	7
12. Gastro-intestinal				
a. Antacid	1000	6	-	-
b. Anti-emetic	0	0	50	9
c. Antispasmodic				
a - atropinemy	870	13	550	8
d. ORS	2650	9	1500	6
13. Oxyrocic	4000	4	0	0
14. Psychotherapeutics				
a. Diazepam	2000	2		
15. Anti-asthamatic	50	1	20	1
16. Vita-Minerals				
a. Vita. C	3000	3	4500	3
b. Multi-Vita	10500	5	19000	5
c. B Complex	11000	4	8000	3
d. Cal. Lactate	3000	3	34000	7
3. Vita A	3500	5	0	0

* PHC U is situated in the `developed' category in our sample.

it is high; it was indented thirteen times in case of PHC Mayani and twenty-four times in PHC Bhuinj (over a period of two years). In both cases, one thousand capsules were made available in two supplies, whereas in case of PHC Undale, 3300 capsules were supplied even though it was demanded a less number of times. This shows a PHC-wise discrimination, as well as the fact that demands made in indents do not reflect need or supply.

4.3 Availability Of Drugs

4.3.1 Availability of a given drug

A spot check in two PHCs on the number and quantity of drugs available, was made. The same is shown in Table 4. As seen in the table, PHC A which falls in the 'average' category, is very poorly supplied as compared to the PHC B situated in Karad taluk.

4.3.2 Range of Drugs Supplied

Range of drugs supplied can be studied from two angles. Drugs can be counted as chemical entities, identified in their generic names, irrespective of their formulation, i.e. whether a drug is available in combination with other drugs or is available as tablet or syrup or capsule or injection in various dosages. Alternatively the range of drugs supplied can be studied by counting all the formulations and dosage forms in which they are available. For example, Penicillin can be made available as adult and paediatric tablets, as paediatric syrup and as injections in 3 forms (Benzyl Penicillin, Procaine Penicillin and Benzathine Pencillin), thus a total of 6 formulations and dosage forms. We studied the range of drugs available in both these forms - i.e. as chemical entities and as formulations.

We found that the nine PHCs under study were supplied an average of 42 generic drugs each during 1990-92 with a minimum of 27 drugs in a PHC in a drought-prone area, to a maximum of 50 drugs in a developed area. Thus more needy but politically weak areas are supplied lesser number of drugs. The three Rural Hospitals were supplied with an average of 35 drugs each, whereas Cottage and Civil Hospitals were supplied with 129 and 151 drugs respectively.

As regards availability of formulations, on an average the PHCs and Rural Hospitals were supplied with 171 and 189 formulations respectively prepared from these 42 and 35 drugs respectively.

This count includes each and every drug supplied, but excludes vaccines under National Programme and contraceptives.

In the same way, the total number of drugs supplied to the Cottage Hospital and Civil Hospital was 129 and 151 respectively. The data in Table 5 and 6 exclude anti-tubecular drugs and very marginal drug supply. Hence the total number of drugs as seen in these tables is less than the total mentioned in the above para.

4.3.4 Regularity of Supply in a Year

We recorded the actual dates of receipt of each drug for drugs at PHC and RH level and the dates when stock was exhausted. Thus total number of days each drug was actually available at the PHC and RH was calculated. This was then converted into percentages of days in a year for which the drug was available.

For a simple presentation of availability, the extent of availability was then graded as below:

NA = Not Available at all
EN = Effectively Not Available = Available 1- 24% of days in one year
VI = Very irregular = Available 25-49% of days in a year
I = Irregular = Available 51-75% of days in a year
R = Regular = Available 76-99% of days in a year
AA = Always available = Available all days in a year

To get an idea of availability over the 9 PHCs in our sample, for two years, we first totalled the number of days for which each drug was available at these PHCs and then divided the same by 18 to get the per year average. This was then categorized according to the classification shown above.

The results are startling. (See Table 5) Nearly 60% of drugs supplied to PHC are in actuality not available for more than 75% of the year. There is no drug (including simple Tab. Aspirin & Paracetamol) that can be classified as always available all through the year at all PHCs.

At rural hospitals a third of the number of drugs listed were not available for three quarters of the year, and another 37.7% were available less than half the year (see table 6)

4.4 Cost of Drugs Supplied

4.4.1 Cost of Drugs supplied to PHCs

The stipulated drug budget for each PHC is Rs.30,000 per year. It has been since revised to Rs.40,000 and Rs.60,000 for PHC and RH

TABLE 4

Spot Check for Number and Quantity of Drugs at Two PHCs.

Name of Drug	Quantity	
	PHC A	PHC B
Tablets		
Tab. Aspirin	20,000	23,000
Tab. Paracetamol	4,000	1,000
Tab. Belladona	—	1,000
Tab. Adelphane	—	100
Tab. Diazepam	300	5,000
Tab. Dulcolax	—	1,500
Tab. Diethyl Carbamine Citrate	—	3,000
Tab. Intokam	—	1,000
Tab. Furazolidone	800	1,000
Tab. Metronidazole	—	3,000
Tab. Methyl Ergomertine	—	1,000
Tab. Mag. Trisilicate	—	1,000
Tab. Al. Hydroxide	—	1,000
Tab. Multivitamin	3,000	2,000000
Tab. Vermitel	—	1,000
Tab. Chloroquine	—	1,000
Tab. Pyrazinamide	—	400
Tab. ETB	—	200
Tab. Isozone	—	2,000
Tab. INH	—	1,000
Capsules		
Ampicillin 250 mg	100	1,500
Chloramphenicol 250 mg	200	500
Tetracycline	200	2,000
Doxycycline	—	160
Syrups		
Paracetamol (Himol)	10 ltrs	12.5 ltrs
Cough mixture	10 ltrs	—
Injections		
Aminophylline	200 amp	2 amp
Atropine	100 amp	100 amp
ASV	15 vials	18 vials
ARV	—	2 vials
Coramine	---	10 amp
Ridalpin	18 vials	12 vials
Oxytetracycline	4 vials	
Lasix	53 amp	
Benz. Peni.	300 vials	50 vials
Soda-bicarb	200 a	—
Dexamethazone		45 vials
Pethedine		60 amp
Phenaveel		40 amp
Water for Injection		100 amp
Xylocaine		30 vials
Calcium Gluconate	200 a	
Intra-venous		

* PHC A belongs to the average district category, while PHC B to developed area.

Table-5

Availability of Drugs at 9 PHCs in Satara District - 1990-92

No	Type of Availability	Number of Drugs	As % of tatal number of drugs	Names of some comonly reqired drugs
1.	AA: Available throughout the year (always available)	0	0	NIL
2	R : Available 76-99% of days in one year (i. e. irregular)	4	2.68	Tab. Aspirin, Tab. Paracetamol, Tab. Furazolidone, IV Normal Saline
3	I : Available 51-75% of days in one year (i. e. irregular)	10	6.71	Septram Cap. Tetracyline 250 mg., Cream Haffkinol 20 g, Inj. ASV, Dextrose 10 %
4	VI : Available 25-49% of days in one year (i.e. very irregular)	45	30.02	Syp. Paracetamol, Tab - Mebendazole 100 mg., Cap. Ampicillin 250, Inj. Benz. Penicillin, Cap. Chloramphenicol, Tab, Chloroquine 150 mg, Inj. Dexamethasone, Tab. FS (small & large), Syp. Vitamin A, Vaccines DPT, DT Inj. Resiphyline, Syp. Vitamin A
5	EN : Available 1-24% of days in one year (effectively not available)	61	54.36	Inj. Adrenaline, Inj. Stemetil, Inj. Phenargan, Tab. Spasmizole K, Tab. Methergin, Inj. Methergin, I/V Dextrose 5%, Tab. Polyvitamin, Tab. B. Complex, Tab. Calcium Lactate, Tab. Almonil
6	NA : Not available throughout the year	9	6.04	Tab. Erythromycin, Tab. Prednisolone, Inj. Siquil, Inj. Perinorm, Tab. Dulcolax
	Total	**149**	**100**	

Data excludes TB drugs and very marginal drugs and includes surgicals.

Table-6

Availability of Drugs at RHs in Satara District - 1990-92

No	Type of Availability	Number of Drugs	As % of total number of drugs	Names of some commonly required drugs
1.	AA: Available throughout the year (always available)	2	1.25	Inj. Ampicillin, I/V Dextrose 5%
2	R : Available 76-99% of days in one year (i. e. irregular)	18	11.32	Tab. Aspirin, Tab. Paracetamol, Inj. Analgin, Tab. CPM 4 mg, Tab. B Complex, Syp. Septran, Inj. Gentamycin, Adhesive Plaster, Sol. Tincture Iodine, Sol. Hydrogen Peroxide, I/V Dextrose Saline, I/V Ringer Lactate, I/V Normal Saline
3	I : Available 51-75% of days in one year (i. e. irregular)	26	16.35	Cap, Ampicillin 250. Tab. Furazolidone 100 mg, Cap. Tetra Cyline 250 mg, Tab Metronidazole 200 mg, Inj. Dexamethazone 4 mg / ml Inj. IV Hemacoel. Inj. Adrenaline 1:1000 ml, Nitrofurazone. Mix Carminative, Tab. Antacid, Inj. Baralgan, Tab. Dicyclomine Inj. ARV, Chloramphenicol eye/ear drops, Inj. Methergin. IV Sodium Bicarbonate 7.5%, Vitamin C, 2mg/ml Tab Calcium Lactate Tincture Benzoin, Cloth Bandage.
4	VI : Available 25-49% of days in one year (i.e. very irregular)	60	37.73	Inj. Xylocaine 1% 30 ml, Syrup Paracetamol 125 mg/5ml, Tab. Avil 25 mg. Inj. Phenaveel 1mlA, Syp. Piperazine 500mg/5ml, Inj. Procaine Penicillin 4l, Syp. Ampicillin 250 mg/5 ml. Tab. Sulphadimidine 500 mg, Cap. Chroramphenicol 250 mg. Syp. Metronidazole 200 mg/5 ml Tab. Dexamethazone 4 mg, Tab. Ferrous Sulphate Small, and large, Lot. Benzyl benzoate 25 %, Sol. Spirit, Tab. DCP, Copper T, Nirodh, Inj. ASV, Inj. Aminophylline 25 mg/ml 10 m, Inj. Respiphylline 2m1A, Syp. Cophekin, Dextrose 25%, Inj. Distilled Water 5 ml, Tab. Polyvitamin, Inj. Calcium Gluconate 10%, Catgut Plain 2-0, Sur. Gauze, I. V. Set, Bid. Scalpel
5	EN : Available 1-24% of days in one year (effectively not available)	51	32.07	Inj. Xylocaine + Adrenaline, Liq. Iron + Folic Acid 500 ml, Crm. Haffkinol 20 g, Sol. Haffkinol 5l, Tab. Prochlorperazine 5 mg, Tab. Atropine 1 mg, Inj. Atropine 1 mg/1mlA Tab. Dulcolax, E/D Albucid 20%, E/D Soframycin, Tab. Methergin 2 mg, Tab. Diazepam 5 mg.
6	NA : Not available throughout the year	2	1.25	Tab. Erboline, IV Dextrose 10%
	Total	**159**	**100%**	

TABLE 7

Cost of Drugs to all Units for Curative & symptomatic care (1990-92)

Category of Drug and its category no.	Primary Health Centre		Rural Hospital		Cottage Hospital		Civil Hospital	
	Average Cost	% of Total Cost	Average Cost	% of Total Cost	Total Cost	% of Total Cost	Total Cost	% of Total Cost
1 Anaesthetics	--	--	--	--	1721.20	0.40%	27530.30	0.80%
1.2 Local Anaesthetics	169.25	0.42%	721.46	0.75%	858.90	0.20%	35284.28	1.02%
2.1 Non-opoid analgesics	3854.56	9.75%	5369.83	5.61%	16085.61	3.74%	57186.20	1.66%
2.2 Opiods	259.23	0.65%	1631.24	1.70%	1682.40	0.39%	16759.00	0.49%
3 Anti-allergics	119.81	0.30%	714.00	0.75%	700.00	0.16%	15379.50	0.45%
5 Anti-epileptics	18.23	0.00%	--	--	500.00	0.12%	3427.52	0.10%
6.1 Intestinal anti infectives	179.65	0.45%	71.06	0.07%	2007.80	0.47%	3472.00	0.10%
6.2.1 Penicillins	2516.80	6.37%	11472.55	11.99%	59639.62	13.86%	443852.90	12.86%
6.2.2 Other Antibiotics	11588.86	29.34%	15010.08	15.68%	59796.92	13.90%	361750.23	10.48%
6.2.3 Anti-tubercular	3418.51	8.65%	2065.40	2.16%	1610.00	0.37%	4950.00	0.14%
6.4.1 Anti-amoebic	310.76	0.78%	3747.72	3.92%	6020.16	1.40%	29832.00	0.86%
6.4.5 Insect Repellant	--	--	--	--	1914.00	0.44%	--	--
8.3 Hormones	104.76	0.26%	763.88	0.80%	--	--	40808.00	1.18%
9 Anti-Parkinsons	--	--	--	--	--	--	145.00	0.00%
10 Blood Drugs Affecting	--	--	--	--	3980.00	0.93%	--	--
10.1 Anti-anaemic	5149.58	13.0%	262.51	0.27%	--	--	7090.00	0.21%
11 Blood Products & Subs	78.52	0.19%	550.21	0.57%	576.00	0.13%	284.00	0.01%
12 Cardiovascular	--	--	0.00	0.00%	--	--	580.50	0.02%
12.1 Anti-anginal	--	--	0.00	0.00%	135.00	0.03%	1477.10	0.04%
12.2 Anti-dysrhythmics	--	--	--	--	10.00	0.00%	3115.00	0.09%
12.3 Anti-hypertensive	6.41	0.01%	73.97	0.08%	80.94	0.02%	9939.00	0.29%
12.4 Cardiac Glycoside	--	--	--	--	--	--	567.33	0.02%
12.5 Drugs in vascular shock	25.20	0.06%	217.72	0.23%	504.80	0.12%	7607.20	0.22%
13 Dermatologicals	--	--	0.00	0.00%	--	--	3304.00	0.10%
13.1 Anti-fungal	6.86	0.01%	--	--	60.72	0.01%	--	--
13.2 Anti-infective	634.04	1.60%	1000.42	1.05%	1800.00	0.42%	10851.00	0.31%
13.6 Scabicides	35.32	0.08%	393.12	0.41%	1706.24	0.40%	4656.00	0.13%
14 Diagnostics	142.97	0.36%	89.25	0.09%	--	--	--	--
15.1 Antiseptics	728.84	1.84%	853.60	0.89%	635.08	0.38%	70260.50	2.04%
15.2 Disinfectants	434.14	1.09%	1079.32	1.13%	8827.80	2.05%	42989.00	1.25%
16 Diuretics	--	--	346.16	0.36%	441.92	0.10%	13747.80	0.40%
17 Gastro-intestinal	--	--	33.92	0.04%	--	--	34.00	0.00%
17.1 Antacids	301.27	0.76%	136.00	0.14%	5160.00	1.20%	10476.00	0.30%
17.2 Anti-emetics	9.67	0.02%	141.72	0.15%	--	--	5613.50	0.16%
17.5 Anti-spasmodic	1121.44	2.83%	2092.43	2.19%	1200.00	0.28%	43918.00	1.27%
17.6 Carthartic	--	--	20.77	0.02%	--	--	5087.00	0.15%
17.7 Anti-diarrhoeal	--	--	--	--	3154.00	0.73%	12032.00	0.35%
17.7.1 Electrolytes	1550.63	3.92%	542.91	0.57%	--	--	--	--
18 Hormones	--	--	--	--	--	--	5986.63	0.17%
18.1 Adrenal	--	--	--	--	--	--	2643.00	0.08%
19.2 Sera	789.06	1.99%	4178.42	4.37%	26767.50	6.22%	367896.00	10.66%
19.3 Vaccines (TT)	--	--	6426.47	6.72%	821.50	0.19%	--	--
19.3.2 Specific vaccines (ARV)	1480.34	3.74%	3889.27	4.06%	32788.84	7.62%	209997.00	6.08%
20 Muscle relaxants	--	--	108.04	0.11%	16.60	0.00%	4867.94	0.14%
21 Opthalmic	--	--	0.00	0.00%	--	--	5423.75	0.16%
21.1 Anti-infective	237.75	0.60%	492.90	0.52%	1739.00	0.40%	37117.30	1.08%
22 Oxytocic	--	--	0.00	0.00%	1762.57	0.41%	--	--
22.1 Oxytocic	1069.03	2.70%	492.57	0.51%	--	--	14339.85	0.42%
24 Psychoterapeutics	86.77	0.21%	237.90	0.25%	482.25	0.11%	44222.73	1.28%
25.1 Anti-asthmatic	18.88	0.04%	265.23	0.28%	1478.65	0.34%	26186.20	0.76%
25.3 Anti-tussive	98.56	0.24%	293.50	0.31%	12583.50	2.93%	20959.71	0.61%
26 IV infusions	739.64	1.87%	8947.90	9.35%	72025.58	16.74%	547414.80	15.86%
26.3 Misc.	98.08	0.24%	537.50	0.56%	--	--	15918.00	0.46%
27 Vitamins	429.71	1.08%	13188.90	13.78%	18419.70	4.28%	102738.80	2.98%
II AYURVEDIC	120.72	0.30%	0.00	0.00%	--	--	--	--
III SURGICALS	1561.97	3.95%	7237.67	7.56%	79465.20	18.47%	751477.78	21.77%

respectively. In practice the supply varies for each PHC. The range (over two years) varies from Rs.19,948 (PHC Vaduj - 1991-92) to a maximum at Rs.71247.40 (PHC Bhuinj - 1990-91); see appendix I and II. Table 7 gives the cost of drugs supplied to the 9 PHCs in our sample. A detailed category and year- wise presentation of cost of drugs supplied to PHCs is shown in Appendix I and II. A similar presentation of category- wise percentages shows a large part of the budget is consumed in anti-anaemic drugs. (Appendix III). As in the case of Khatav (90-91) the cost of anti-anaemic drugs takes up almost half the Rs.40,000 worth of drug supplies made to the PHC. This is because the 'Iron and Folic Acid' supplies made in syrup form in small bottles (150 ml) are extremely expensive. 'Other antibiotic' category, penicillins and non-opoids also occupy substantial portions of the budget. For a percentage-wise distribution of cost as per WHO Essential Drug List Categories, to all units (PHCs, RHs Cottage and Civil Hospital) under study, see table 7.

For 1990-91 , total expenditure on drugs by the DHOs office was 24 lakhs, of which 5 lakhs (21%) was for 20,000 sterlisations performed that year. In the single PHC where drugs supplied under the Family Planning Programmes were recorded separately, the cost totalled Rs. 4380.00 and Rs. 3382.30 for 1990-91 and 1991-1992 respectively. That is, 11% of the total cost of supplies to that PHC.

4.4.2 Cost of drugs supplied to Rural Hospitals

Of the ten rural hospitals in Satara district, we studied three to determine the actual cost of drugs supplied to these units. As with PHCs the supply varied with each unit. The cost of supply was as low as Rs.29,105.68 in RH Vaduz (1990-91) to Rs.1,39,998.84 at RH Wai in the year 1991-92. The average was Rs. 95698. Antibiotics as expected, consume more than quarter of the total cost (see Table 7). For a category-wise breakup for each of the three RHs, see Appendix IV.

4.4.3 Cost of drugs supplied to Cottage Hospital

The cost of drugs supplied to Karad Cottage Hospital is shown in Table No 7. As with PHC and RH a large portion of the budget is taken up in Penicillins and other antibiotics. However, we see a higher expenditure on Surgicals (33.7%) as the level of health care goes up. (also see Appendix V).

Another significant finding is that 15.2% was spent on brand drugs. A category wise break-up of these brand drugs is given in Appendix VII. Appendix VII also gives Karad Hospital's expenditure on irrational drugs.

4.4.4 Cost of Drugs supplied to Civil Hospital

A presentation of the category wise cost of drugs supplied to the Satara Civil Hospital for two years is shown in table 7 and Appendix VI. The major expenditure is on Penicillins (15.19%), antibiotic 10.1%, Inj ASV 10.35%, Inj. ARV 4.9%, IV Infustions 15.4% and surgicals 21.5%.

Data regarding **local purchase** available for the year 1990- 91 totalled Rs. 22,221,33 and from 1.4.91 to 6.10.91, Rs. 43,147.43. That is a total of Rs. 65,368.76 of which 11.6% we categorised as expenses on irrational drugs.

5. DISCUSSION

In India, there have been no studies which have analysed the drug supply to the Public Health Sector in the detailed manner, as we have done nor has drug supply to private sector in a district been studied. A study in Tamil Nadu (Ayyadurai et al, 1987) by DANIDA was specifically devoted to 'Drug Supply to PHCs in Tamil Nadu'. But it has neither measured the actual drug supply in a detailed manner, nor has studied the availability of drugs in detail as we have done. The other study by DANIDA (DANIDA 1986) studied drug supply in detail for one year in one PHC. Their findings are similar to ours. This study, however, studied drug supply only in physical quantities, and not in money-terms also. Secondly availability has not been studied as per the 6 categories as we have done. Thirdly drug data were not arranged as per WHO categories as we have done.

5.1 Methodology

The study methodology attempts to empirically verify statement about drugs supply, cost, utilisation and indenting procedures. Using observations made by previous studies and experience, attempt was made to investigate particular sections and aspects of drug supply and use in the public sector. The time spent on the field and in compiling the tables presented, have allowed us category wise presentations of availability and cost. The details regarding utilisation, cost, and quantity of drugs indented were also painstakingly collected, but not presented in this report. This was because we felt that the comparisons of amounts indented, utilised and supply did not show any

significant relation to each other, nor did such data bear any use to the general trend of the study findings.

Our experience on this study however bears some lessons for the future. The universe of the Public Sector, the major focus of this Part I of the study is largely similar. It would perhaps have paid us more dividends to have concentrated on the district level distribution of drugs, particularly in the case of supplies under national programmes such as TB, Malaria, Leprosy, UIP etc. The data available at individual units are more than often incoherent and we spent large amounts of time sorting them out and compiling figures into a logical results.

It would have been useful to narrow down our sample for the category wise presentations, cost and availability with the same results though in quicker time. Even then, the present sample-size of 9 of the 69 PHCs, 3 of the 10 rural hospitals, the only functioning Cottage hospital and the district level Civil Hospital has its own obvious advantages.

5.2 Sales in the Private Sector

The drug sales figures in our study of private sector pertains to the year 1992-93. Presuming a 20% increase in sales yearly, the figure for 1991-92, the previous year, would be a minimum of Rs. 21.28 crores. Divide this by the Satara population of 2.45 million for the same year, we have an expenditure of Rs. 86.86 per capita per year.

If this is extrapolated to all India basis, (population 84.63 crores in 1991) the minimum drug sales in India amount to Rs. 7351 crores in 1991. This is the absolute minimum estimate, based as it is on audited drug sales of the major wholesale dealers operating in the district. An estimate of drug industry sales at Rs. 7,500 crores is also made by Dr. Naresh Banerjee (Banerjee 1995).Ours is based on audited amounts of major distributors.

An estimate of Rs. 4,200 crores for *bulk* drugs (1990- 91) crores has been made by Anil Pilgaonkar, (Pilgaonkar, 1993) through an extrapolation of ORG retail sale figures.

5.3 Availability of drugs at the PHC and RH level.

As expected, the number and quantity of drugs available at this level of health care is low and irregular. However, of surprise is the fact that simple analgesics like aspirin and paracetamol are also not available at all times. Though the supply at the RH is somewhat better, the fact that over 70% of drugs are not available for more than half the year, speaks about the poor state of affairs at the village level public health care services.

5.4 Drug Supply to the Public Sector

If our findings have to be extrapolated to the district level, then the cost of all category of drugs (excluding Leprosy, Contraceptives and vaccines under the immunization programmes) would be as follows.

Average cost of supply/unit (from table no. 7)		No of Units	Total (Rs.)
PHC	Rs. 39,495.80	69	2725210.20
RH	Rs. 95,697.49	10	956974.90
Cottage	Rs. 2,15,080.00	1	215080.00
Civil	Rs.17,25,597.70	1	1725597.70
	Total		**56,22,862.80**

The total supply to the public sector in 1991-92 (excluding vaccines and contraceptives) was thus Rs. 56.23 lakhs while the lowest estimate we have of the private sector is 21.28 crores.

6. CONCLUSION

We conclude that :

i) The Public Health Sector in Satara district is very poorly supplied with drugs and accounts for a mere 2.6 % of the total drug consumption in the Satara district. There are continuous, gross shortages of Essential Drugs in PHCs and rural hospitals.

ii) The sale of drugs in the private sector in the Satara district in 1991-92, was at least Rs. 21.28 crores, which is 38- times the drug supply to the public sector.

❑

USE OF PHARMACEUTICALS IN SATARA DISTRICT

Objectives

The overall aim of this second phase of the study was to study the use of pharmaceuticals in Satara district. In pursuance of this overall aim, the following specific objectives were delineated.

A) To study the prescriptions of doctors in public and private sector in order to assess their rationality ; the extent of the use of unnecessary, irrational, hazardous drugs and unnecessary injections. To explore the correlation of these aspects of prescriptions with the educational qualification of doctors, and the relevant socio-economic factors in Satara district.

B) To study the factors affecting prescription behaviour of doctors, viz. Continuing Medical Education of doctors, extent of competition amongst doctors ; marketing practices of drug-companies and drug-stores etc.

C) To assess the knowledge status of nurses in PHCs about the drugs they commonly use and thereby to indirectly study the use of drugs by such nurses.

D) To study the extent and nature of sale of prescription drugs (schedule drugs) which are sold over the counter (OTC) without prescription.

E) To estimate the wastage in both public and private sectors on account of use of irrational drugs by doctors.

F) To study the extent of expenses incurred by patients on account of "private-prescriptions" given by doctors in the Public Health Facilities. (PHFs).

G) To study the morbidity pattern in PHC-OPD (Out - Patient-Department) and to estimate the average drug requirement and drug budget of PHCs if all the patients coming to the PHC- OPD were to be adequately and rationally treated. To compare this need with the actual supply of drugs to PHCs.

Methodology

The methodology for each of the sub-components of this study was designed according to the objectives and has been described at the beginning of each of the corresponding subsection of this report. The overall sampling frame has been described in the section-A i.e. Prescription-Analysis. The specific methodologies as given in different sections are to be seen in the context of this sample frame.

PRESCRIPTION- ANALYSIS

Introduction

In developing countries like India, a substantial proportion of medicines in the market are irrational fixed dose-combinations, and some of them are even hazardous. Different analysts and activists of the movement for Rational Drug Policy, have sharply brought out this point (Jaya Rao, 1977, Sunderaman 1986, Phadke 1985, Desai 1989, 1990,1991). Because of the irrational drug-combinations, a lot of money spent by the patients on drugs is wasted. Secondly many doctors use even rational drugs irrationally. Such use also adversely affects patients both health-wise, money-wise. Prescription-analysis of a properly selected sample of prescriptions would reveal the extent of use of irrational, hazardous drugs by doctors as well as extent of irrational use of rational drugs. It would also reveal the extent of scope for saving financial resources if irrationalities were to be eliminated. In a country like India, where resource-crunch is considered an important obstacle in providing even basic health-services such cost - saving would be quite valuable. There is thus a need to assess the extent of wastage due to irrational prescriptions and develop ways to overcome these wastages. Medical journals devoted to Continuing Medical Education, and specifically to rational therapeutics (Drug Disease Doctors, BODHI, BSRT) have, occasionally, analysed irrational prescriptions as illustrative examples. Some analyses have pointed out common irrationalities in drug therapy of particular diseases (Nahar et al 1987, Desai et al 1989) or in a particular hospital (Uppal et al 1987). or a particular PHC (DANIDA 1986). There have been reports of study of prescriptions-practices in a couple of villages (Dixit 1993) or an urban locality (Ghosh et al 1987). Medico-social activists have reported unnecessary use of tonics, medicines by doctors and its implications for poor patients (Shatrughna 1985, Sadgopal 1985). But these are all isolated bits and pieces of studies which give only an inkling into different aspects of irrational prescription-behaviour.

To our knowledge, no systematic study has been made in India to estimate the extent of irrationalities in drug-therapy and the consequent financial wastages. In fact, barring a few exceptions (Greenhalgh 1987, Krishnaswamy et al 1985, Prabhashankar 1981) there are no systematic published studies of prescription-analysis of Indian doctors. As will be pointed out in the discussion later, (section A.6.1) these studies have a restricted, non-representative sampling and two of the three studies have not analysed prescriptions in relation to the diseases for which they were given.

Secondly, so far, systematic comparison has not been made between prescription-practices in the Public and Private sector or, between allopaths and non-allopaths. It has become fashionable to say that Public Health Services are of low quality and further privatization and 'liberalization' would improve the quality of medical care. But there has not been a comparative study of prescriptions of doctors in these two sectors to compare their rationality. Similarly, the attitude and the policy about non-allopathic doctors who indulge in the use of allopathic drugs, has to be based on some scientific study of whether or not and to what extent, non-allopathic doctors using allopathic drugs indulge in irrational prescriptions, as compared to the qualified allopaths. As a part of the study of supply and use of pharmaceuticals in an average district in Maharashtra, we therefore decided to study a properly selected and sufficiently large sample of prescriptions of different categories of doctors in order to address the issues mentioned above. ❑

A - 1 : Objectives and Study Design

A-1.1 : Objectives

To study the prescriptions of doctors in a district in Maharashtra in public and private sectors, in order to assess the rationality of these prescriptions and the extent of use of unnecessary, irrational, hazardous drugs, and unnecessary injections.

To co-relate these aspects of prescription-behaviour with the educational qualification of doctors, their being in the private or public sector and the geographic situation of prescribing doctors (urban or rural area, developed or backward area).

A-1.2 : Study-Design

This is a prospective, cross-sectional study of prescriptions of various types of doctors in Satara-district, an averagely developed district in Maharashtra. As per WHO - INRUD recommendations, ten to twenty doctors belonging to different categories (allopaths, non-allopaths, private sector, public sector, urban, rural, backward, developed and average area) were selected through purposive sampling. First 30-35 prescriptions in a day in the out-patient clinic were collected prospectively; one day for each type of doctor in each of the three seasons - Summer, Monsoon, Winter, during 1993 - about 90-100 prescriptions per category of doctor.

Prescription-analysis was carried out with the help of specially prepared Standard Drug Treatment Regimens, (SDTRs) Prescription Analysis Guidelines (PAGs) and a scoring system to analyse the extent of use of unnecessary, irrational, hazardous drugs and irrational injections and to assess overall rationality of the prescriptions. The results of prescription-analysis of different categories of doctors were compared statistically.

A-2. : Materials and Methods

A-2.1 : Sampling

The international Network for Rational Use of Drugs (INRUD) and the WHO, after an indepth statistical consideration, and assuming highest standard error, have recommended that a minimum of 10 (preferably 20) health-centres with a minimum of 30 prescriptions from each of these centres, be selected for a cross-sectional study and comparison of prescription practices (WHO 1993). (Please see section A-6 for details). We followed this recommendation and selected health-centres for our study as follows -

A-2.1.1 : Selection of Public Health Facilities

To get a representative sample, the Satara district was divided into three zones - backward, average and developed zone as in the first phase of the study. At least five Primary Health Centres and one Rural Hospital from each of the three zones, (a total of 24 out of 69 PHCs and 3 out of 10 RHs in the district), the only functioning Cottage Hospital (out of two) in the district and the District Civil Hospital were selected through purposive sampling, yielding a total of 30 Public Health Facilities (PHFs).

While selecting PHCs, those with more than average annual OPD attendance for the PHCs in respective Taluks, were to be given preference. This was to ensure that we get a minimum of 30 prescriptions in a day. (For logistical reasons, we wanted to complete data gathering in a PHC in a single day).

Within these broad guidelines, the actual selection of the PHCs out of 69 PHCs was left to the logistical convenience. However, care was taken to avoid the usual bias in favour of PHCs on the state or district highway.

Rural Hospitals were selected in the same way as PHCs. Since some PHCs had less than 30 OPD cases in a day, we added more PHCs to the sample than the minimum necessary 15 PHCs. The selection of additional PHCs was left to the convenience of logistics. However, care was to be taken to see that minimum 30 prescriptions were collected for each category of PHC, per season.

To take care of the seasonal variation in sickness profile, a minimum of 30 prescriptions were collected from each type of the centre selected, in each of the three seasons - Summer, Monsoon, Winter; during 1993. A total of 100 prescriptions per centre in the year; an overall total of 2000 prescriptions were thus to be collected from the 20 PHFs selected.

A-2.1.2 : Selection of Private Clinics

For the study of private sector, prescriptions of one type of doctor from each of the following educational backgrounds was chosen from each of the three geographical areas mentioned above. The educational background was classified as follows - (a) Post-graduate, (b) MBBS, (c) non-allopathic degree holder (Ayurvedic or Homeopathic - both types as a rule prescribe allopathic medicines) and (d) Registered Medical Practitioner (who doesn't have any recognised degree as such). A minimum average of 30 prescriptions each from the twelve private practitioners were to be selected from urban and rural areas during each of the three seasons in 1993; about 2400 prescriptions from 24 private practitioners in all. More than this minimum number of practitioners were to be studied if possible. Urban area was defined as one having a Municipality as against the Gram-Panchayat for rural area.

In urban areas, the actual selection of the doctor was to be done through an acquaintance if any or through the cooperation of the office-bearer of the local doctor's organisation. In rural areas, there was generally no choice as there was often only one doctor in that village from the particular category of doctor (MBBS, consultant etc.) we wanted to study. The first doctor (from each type), who agreed to cooperate, was thus chosen in rural areas. Barring one exception, nobody refused to co-operate.

Private practitioners were generally selected from the same village or town from where doctors from the public sector were chosen so that comparison between the two would become more meaningful.

A-3 : Data-Gathering

A-3.1 : Prospective Data Gathering

Prescriptions from doctors in the above sample were collected in their OPDs during May 1993 to November 1993. Trial data-gathering was done in a PHC in summer, retrospectively, by noting down the drugs prescribed from every 20th case paper. It was, however, realized that patients attending PHCs are sometimes asked to buy a few of the medicines from the drug-store, since PHCs have short supply of medicines. These prescriptions are not recorded in the case paper. Similarly, in private practice, some drugs are prescribed and some are dispensed. To record all drugs given to the patient, it was decided to record the data prospectively. A pharmacist- investigator was posted in the clinic to record both types of drugs - those given in the dispensary and those prescribed for buying from a medical shop. Data collection was done by a team of five pharmacist-investigators. The main PHF OPD is generally in the morning. The PHFs were therefore visited in the mornings and the private practitioners in the afternoon or evening. Each pharmacist thus visited two centres in a day and the data gathering was completed by a team of 6 pharmacist-investigators in 5 days each in May, July and November 1993.

A-3.2 : Co-operation of Doctors

Doctors were told about our aim of studying prescription patterns in different areas; and were assured confidentiality of their identity. They were, however not informed that their prescriptions would be subjected to rigorous analysis.

To our surprise, the response of even the private doctors was very good and they allowed us to copy their prescriptions. They were not told about our objective of analysing the rationality of their prescriptions. Only one private practitioner refused to co-operate. For Public Health Facilities, a letter of introduction from the Health Secretary of Maharashtra State served the purpose. In some PHCs, even that much was not needed. Thus overall there were hardly any **non-respondents** due to refusal to co-operate.

A-3.3 : The Investigators

Six pharmacists, with a diploma in pharmacy, and at least 'a year's experience were recruited to copy down doctors' prescriptions. Their experience ranged from one year to 20 years. They were given an orientation to the study in a day about the objectives and the study-design. The importance of faithfully recording both the dispensed and prescribed drugs along with their dosages and of recording the diagnosis or symptom was emphasized. If they did not understand a particular diagnostic terminology or a brand-name or doctor's handwriting, they were to seek clarification from the doctor on the spot. For uncommon brand-names, they were to write the corresponding generic name so that the analyst would not be hindered by strange brand names.

In the first round of data collection, the principal investigator and the pharmacist Research Officer accompanied the pharmacist investigators for helping them to get doctor's permission to sit in the clinic to copy down prescriptions. The data-sheets (Annexure - A-IV) filled by investigators were checked every evening to detect deficiencies, to seek clarifications and to give further instructions if needed. The pharmacist Research Officer participated herself in data-collection in all the three rounds of data-collections besides supervising the work. Since all the pharmacists were sufficiently experienced and the work involved was to simply copy down patients' diagnosis and drugs given, they did their job well. Main difficulty was copying down correctly, the diagnostic terminology with which the pharmacists were not quite familiar. Secondly, recording of dispensed and prescribed drugs separately was not done properly in the initial round by some pharmacists.

A-3.4 : Difficulties

Initially it was thought that the prescription practice of post-graduate doctors could be more easily studied by collecting their prescriptions at the pharmacy shops only, since most post-graduate doctors do not dispense any medicines from their clinic. However, it was realized that, at a public place like a pharmacy shop, patients were not keen to divulge what complaints they were seeking treatment for. Therefore this method was not pursued and instead, we copied down the prescriptions of post-graduate doctors also, by posting a pharmacist-investigator in their clinics.

We were not able to get certain categories of doctors in adequate numbers - for example, consultants in rural area and RMPs in urban area - since their availability in respective areas itself is low. But whichever category of doctors was included in the study, we saw to it that a minimum of 30 prescriptions were collected for that category, either from the same doctor or some other doctor in the same category.

In our first round of data collection, in summer 1993, we found that many doctors get less than 30 cases a day. In the next two rounds of data collection, we therefore visited more number of doctors belonging to the same category. Thus, we had a larger number of doctors in our study than planned, but lesser number of prescriptions. Thus instead of 15 PHCs, we visited 24 PHCs and collected a total of 1944 prescriptions (instead of 2000) from 59 visits to 30 PHF's in the three seasons in 1993. Similarly, in the private sector, only 1638 prescriptions (instead of 2400) were collected from 62 visits to 19 private practitioners in 3 seasons.

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A-4 : Plan of Analysis

A-4.1 : Rationality Indicators

Selection of appropriate indicators for assessing rationality of prescriptions is an important issue. We chose the following rationality/irrationality indicators. (The rationale for selection of these specific indicators has been provided in sub-section 6.2 in the section "Discussion".)

A-4.1.1 : Average number of drugs prescribed and percentage of prescriptions containing more than 3 drugs.

A-4.1.2 : Percentage of prescriptions containing :

a) irrational drug/s
b) unnecessary drug/s
c) hazardous drug/s
d) unnecessary injection/s

A-4.1.3 : Marks Assigned to Prescriptions

The above indicators study only specific aspects of prescriptions. An indicator is necessary which would study the prescription as a whole. Such an indicator viz.- marks obtained by each prescription as compared to a possible maximum of 30 assigned marks per prescription, was developed for this study including the duration of therapy. An elaborate system was devised to analyse each prescription and to give marks on the basis of defined criteria. This system is described below briefly -
(The accompanying 'format for prescription analysis' would help to clarify this method of giving marks to prescriptions).

Thirty marks were assigned to each prescription. The thirty marks were distributed as follows:-

Main drug - 20 marks; complementary drug - 10 marks. Out of these total marks, half the marks for each of these two categories of drugs were assigned for the correctness of the type of drug chosen, and half for the correctness of the dose given, including the duration of therapy. If more than two drugs are needed in a condition, the marks assigned were sub-divided accordingly. Thus, in case of infected wound, ten marks each were assigned for an anti-microbial, an analgesic and tetanus toxoid; half of these ten marks i.e. five marks in case of each of these three drugs were assigned for the type of drug chosen and the remaining five marks for the dosage of each drug.

Format for Prescription Analysis

Place: Pvt/Public : Avg.OPD/day :
Name of doctor : Degree: Age : Sex:

(1) Sr.No.	(2) Diagnosis/ Main Symptom	(3) Age	(4) No.of Drugs	(5) Main Drug Type I Dose (10) I (10)

(6) Comple.Drug Type I Dose (5) I (5)	(7) Irra. drug (-5)	(8) Haz. drug (-10)	(9) Irra. inj. (-5)	(10) Unn. drug (-5)	(11) Grossly irra. drug (-10)	(12) Total marks (30)

With the help of Standard Textbooks available to Indian doctors, **Standard Drug Treatment Regimens (SDTR)** were prepared for 92 common conditions encountered in these case-papers. These SDTRs were sent to three pharmacologists, two physicians, two experienced doctors working in NGOs in rural areas and an experienced general practitioner. After getting their comments, the revised, final version of these SDTRs was prepared (See Annexure No.A-I). Preparation of these SDTRs for 92 diseases was one of the most important steps in this study.

Marks were given to each prescription in the light of these SDTRs. Negative marks as specified in Annexure - A-II were given for use of (a) unnecessary drugs, (b) irrational drugs,
(c) grossly irrational drugs, (d) hazardous drugs and
(e) unnecessary injections. These categories were defined as follows :
a) **Unnecessary drug or injection** - a category of drug or formulation not included in the SDTR. However, rational alternatives to drugs mentioned in SDTRs were not considered as unnecessary.
b) **Irrational drug or drug combination** a drug or drug combination not recommended in the standard textbooks of pharmacology or other established scientific literature. A list of fixed Dose Drug Combinations recommended by

standard textbooks has been given in Annexure A-III. FDDs not listed in Annexure A-III were considered as unnecessary.

c) Grossly irrational drug - drugs which are totally irrational, or useless - e,g.. Inj. B1+B6+B12; haemoglobin-containing irontonics; enzyme prepations,ect.

d) **Hazardous drugs**
i) Drugs listed in the book - "Banned and Bannable Drugs" published by the Voluntary Health Association of India, New Delhi. Second edition 1986;
ii) Hazardous use of rational drugs as indicated in section C -ii in annexure - A-II

16 detailed guidelines, grouped under four categories were prepared for giving marks to prescriptions in case of different types of mistakes committed by the doctors. These **Prescription Analysis Guidelines'** (PAGs) were sent for comments to three pharmacologists, three clinicians and were also presented to a group of pharmacologists and physicians for comments. Based on their comments, a revised version was prepared. It will be seen from these guidelines, (Annexure A-II), that they are liberal to the doctors. Prescription analysis of all the collected prescriptions was carried out on the basis of the marking system described above, the SDTR and these liberal Guidelines.

A-4.1.4 : Grading of Prescriptions

Each prescription was graded according to the number of marks obtained by that prescription (out of a total possible 30 marks) on the basis of the following criteria -
a) upto 14 marks - irrational - I
b) 15 to 24 marks - semi-rational - S
c) 25 to 30 marks - rational - R

These criteria of demarcation are somewhat arbitrary. However, when a few prescriptions which intuitively looked irrational or semi-rational as per SDTR, were analysed with the above marking and grading system, it was found that the overall judgment about these prescriptions matched with the grading arrived at, through the detailed process described above. Analysis of some 'border-line' prescriptions also indicated that these demarcating criteria are appropriate. Nevertheless, the frequency distribution of marks obtained by all the prescriptions has also been prepared. (Annexure A-V, A-VI). The class interval for this exercise is as follows: upto zero, one to five, six to ten .... etc. Thus comparison between marks obtained by different types of doctors can be done by using any other demarcating criteria.

A-4.2:Categorization of Prescriptions

The primary tables of analysis of prescriptions were in putted on the Lotus-system for analysis. Chi-square test and two sample t test were conducted to assess statistical significance of differences in proportion of undesirable drug use amongst different categories of doctors (for tables A-3, A-5). F-Test was employed for differences in average score per prescription (Table A-4, A-6).

Prescriptions were divided sector-wise (public and private sector), area-wise (urban, rural, small town), development zone-wise (average, developed, backward) and education-wise (Consultant, MBBS, Non-Allopaths, Registered Medical Practitioner) groups. The seven indicators of rationality mentioned in Section A-4.1 were used in analysing prescriptions of these different categories of doctors. As for area-wise categorization of prescriptions, instead of categorizing them simply as urban and rural, we classified them into urban, rural and small towns. (small towns as defined by the Census). This is because, doctors in small towns have their distinct characteristics of medical practice. On the one hand, like rural doctors, they cater to primarily rural illiterate patients and they generally are not qualified allopaths; on the other hand their practice is affected by urban trends and commercialization - there are a few medical shops around and Medical Representatives of drug companies do visit them and influence them. Hence their practice tends to be more irrational because of the combined effect of lower awareness of rural patients with the commercial interests of the medical establishment.

We have used public sector and private sector as a basic analytical category because the procurement of medicines in public sector is quite different from that in the private sector and the public sector doctors are not subject

to the same level of influence of medical representatives, nor are they exposed to the commercial competition amongst doctors as in the private sector. This hypothesis was more than vindicated by the results of the analysis of prescriptions.

A-4.3:Disease-wise Rationality Score

We wanted to study disease-wise rationality score of prescriptions to know which diseases are more rationally treated or otherwise. The diseases encountered in these prescriptions were arranged alphabetically and coded serially from no 1 to 92. The average score per prescription per disease in public and private sector for summer and winter season in 1993 was calculated with the help of Minitab-system (Rainy season data were not computerized and hence could not be analysed for disease-wise rationality). The frequency of these different diseases in the 2433 prescriptions in the summer and winter season, was also calculated.

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A-5 : Results

A-5.1 : Geographical Distribution

Tables A-1, A-2 and maps 1 and 2 give geographical distribution of the health-centres studied. Villages or towns visited once, twice or thrice have been marked separately in the maps. In case of public sector, there was only one clinic in one in the same village or town

Table A-1

PHCs Selected for Study in Satara District

	Area/Tehsil	No. of PHCs	No. of PHCs Selected
	(a) Developed Zone		
01	Karad *Taluka*	11	4
02	Koregaon *Taluka*	06	0
03	Phaltan *Taluka*	06	2
	Subtotal (a)	23	6 (24%)
	(b) Average Zone		
04	Wai *Taluka*	04	4
05	Khandala *Taluka*	03	2
06	Satara *Taluka*	08	4
	Subtotal (b)	15	11 (44%)
	(c) Backward Zone		
07	Khatav *Taluka*	07	3
08	Man *Taluka*	05	0
09	Javali *Taluka*	06	3
10	Patan *Taluka*	13	1
11	Mahabaleshwar *Taluka*	02 (PHU)	1
	Subtotal (c)	31+2(PHU)	8 (32%)
	SATARA DISTRICT Total	69 +2 (PHU)	25 (100%)

Source : Annual Report of Satara Zilla Parishad, 1990-91.
Note :- PHU-Public Health Unit; in rural area, some of them are like PHCs.

and hence the total number of visits to different places (as seen in Map-1) equals number of PHFs selected for study. In case of the private sector, there were a number of doctors in the same village or town and hence there is no congruence between total number of visits to different places (as seen in Map 2) and the number of private clinics included in the study.

It will be seen from table A-1 that certain Talukas have been underrepresented. This is because our selection was blind to the Taluka-wise distribution; the criteria for selection in the purposive sampling was not Talukas but zones.

To make up for the shortfall in number of cases in PHCs due to low OPD attendance, a few PHcs were added to the original sample. In this process the planned bias towards high attendance PHCs was obliterated. Half of the 25 PHCs studied had OPD attendance less than annual average OPD attendance in the district.

Table A-2 shows zone-wise distribution of private and public sector prescriptions. It will be seen from this table that the number of prescriptions from the backward zone in the private sector are less than those in other zones. But since we do not know the total OPD attendance in public and private sector in these three zones, we cannot comment whether this sample of prescriptions is representative or not.

Table A-2

Geographical Distribution of Prescriptions Collected for Study in Satara District

	Average Zone			Backward Zone			Developed Zone		
	Pub	Pvt	Total	Pub	Pvt	Total	Pub	Pvt	Total
No. of visits to clinics	22	28	50	19	11	30	18	23	41
No. of Prescriptions	631	586	1217	589	295	884	724	757	1481

A-5.2 : Other Characteristics

The distribution of prescriptions across sectors (public and private), developmental zones (average, developed, backward); educational qualifications (consultancts, MBBS, non-allopaths, RMPs) and locations (rural, urban, small town) is seen in table no.A-3. Here again, the proportional representation of these categories of doctors and prescriptions cannot be assessed, bacause we do not know the relative proportion of total number of doctors and their prescriptions in Satara district.

As will be argued in Section 6.1, the sample of prescriptions we have drawn is adequate for this cross-sectional study.

We have not analysed the age, sex, income, etc. of the prescribers because there is no reason to believe that these attributes of the prescribers have any significant role in shaping the rationality of prescribers. Continuing Medical Education; role of Medical Representatives; availability of drug-store nearby, degree of competition amongst doctors, these factors affect prescription-behaviour. They have been described qualitatively in section B of the current study. These factors have not been quantified and controlled in comparing prescriptions of doctors from different sectors, zones and educational background. But since the prescriptions from different types of doctors have generally been from the same village or town, these above factors have been probably controlled automatically.

A-5.3 ; Extent of Undesirable Drug Use and Rationality Score of Different Categories of Doctors

Table nos. A-3 to A-6 reveal the following trends in rationality-status of prescriptions from different categories of doctors in Satara District.

A-5.3.1 : Overall Picture :

The proportion of **undesirable drug use** (Table A-3) is quite high for all types of doctors taken together. Similarly the overall **average score** per prescription is only 14.22 out of 30 (Table A-4). The overall proportion of rational, semi-rational and irrational prescriptions is 18.2%, 37% and 44.8%.

A-5.3.2 : Sector-wise differences

Undesirable drug use

For all types of **undesirable drug use**, (Table A-3) the proportion is significantly less in public sector as compared to private sector ($p <= 0.01$) except in case of use of unnecessary injection, in which case public-sector performance is worse than that of the private sector. However, this difference in the use of unnecessary injections is not

satatistically significant.

Average Score per prescription

The **average score** per prescription (Table A-4) is also significantly better (16.14) in public sector than in the private sector (12.52) ($p <= 0.01$).

A-5.3.3 : Area-wise Differences

Undesirable Drug Use (Table A-3)

In the **public sector**, except for use of more than 3 drugs per prescription,the performance for all other indicators of **undesirable drug use** (Table A-3) is worst in small towns. Comparison between unban and rural prescriptions within the public sector shows that the proportion of irrational and hazardous drugs is less in urban prescriptions whereas proportion of use of more than 3 drug per prescription, of unnecessary injections and drugs (indicators of over-drugging) is higher in urban prescriptions. The differences in rural,urban, small towns in undesirable drug use are highly significant ($p <= 0.01$).

In the private sector, a more varied picture is seen as regards **undesirable drug use**. Use of more than 3 drugs per prescription is highest in urban prescriptions, whereas use of irrational, hazardous, unnecessary drugs and unnecessary injections, is highest in small towns. Undesirable drug use, reflected in all five indicators is lowest in rural area. These differences within private sector are highly significant ($p <= 0.01$).

It therefore seems that in the private sector, better availability of doctors and medicines in urban areas and small towns, as compared to rural area, paradoxically results in higher **undesirable drug use**.

Average Score Per Prescription (Table A-4)

The respective pattern in both public and private sector as in case of undesirable drug use is reflected in **average score per prescription**. But the differences are statistically not significant.

A-5.3.4 : Zone-wise Differences : Please refer to section 6.1.

A-5.3.5 : Education-wise-Differences

Undesirable Drug Use (Table A-5)

In general, undesirable drug use increases as we go down the educational ladder from consultants to Registered Medical Practioners. The RMPs indulge the most in undesirable drug use. However, in case of the three indicators which reflect over-use of drugs- more than 3 drugs per prescription, irrational and unnecessary drug, the **consultants** show the worst trend; whereas in the other two indicators of undesirable drug use (use of unnecessary injections and hazardous drugs), the consultants show the least tendency.

Amongst consultants, undesirable drug-use is significantly higher in private sector, compared to public sector ($p <= 0.01$) except in case of use of hazardous drugs.

MBBS doctors' prescriptions are midway between those of the consultants and 'non-qualified allopaths' (non allopaths who use allowpathic drugs and RMPs) in undesirable drug-use. Amongst MBBS doctors, prescriptions of public sector doctors show lesser undesirable drug-use as compared to private sector doctors. This difference is most pronounced in the use of irrational drugs. However, in case of unnecessary injections, public sector doctors indulge in their use more as compared to the private doctors. The difference between the two is however statistically not significant, whereas the differences between public and private prescriptions in the other 4 types of undesirable drug uses are statistically highly significant ($p <= 0.01$).

Prescriptions of **Non-allopathic doctors** show undesirable drug use which is one step worse than those by MBBS doctors for all the five indicators, ($p <= 0.01$) and the differences in public and private sectors are remarkably similar to those in case of MBBS doctors.

As mentioned earlier, the prescriptions of **Registered Medical Practitioners** show the highest level of undesirable drug use except for use of irrational drugs and more than 3 drugs per prescription, in which case, the most educated doctors, i.e. the consultants showed the highest proportion. All these differences in level of undesirable drug-use between consultants, MBBS, Non-allopaths and RMPs are highly significant ($p <= 0.01$).

Average Score Per Prescription

Map No. 1 (Satara District)

Geographical Distribution of

Public Health Facilities Selected

Area

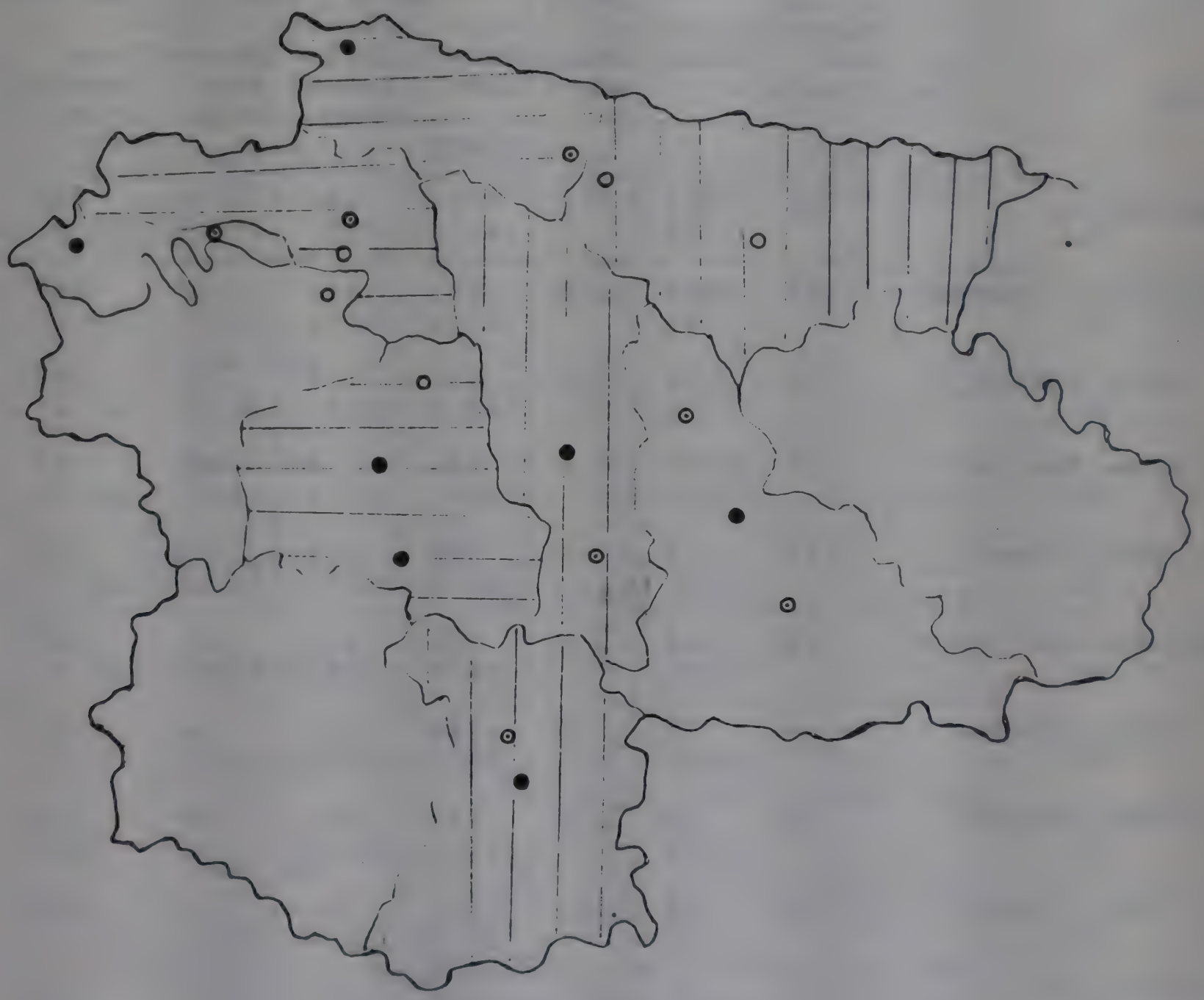
Developed — Average — Backward

Public Health Facilities	Total Centres	Visited once	Visited twice	Visited thrice	Total visits
PHC	25	8	11	5	45
Rural Hospital	3	-	1	2	8
Cottage Hospital	1	-	-	1	3
Civil Hospital	1	-	-	1	3
Total	30	8	24	27	59

Map No. 2 (Satara District)

Geographical Distribution of

Private Clinics Selected



Area Code -

Developed — Average — Backward

No. of visits - Visited

Once (5 Centres) — Twice (7 Centres) — Thrice (7 Centres) — Total - 40 (19 Centres)

Table No. A-3

Prescription Analysis of Doctors in Satara District

EXTENT OF UNDESIRABLE DRUG USE
Sector-wise and Area-wise Comparison

Sector	No. of visits to Clinics	No. of Cases	No. of Drugs per Rx	No of prescriptions containing: More than 3 Drugs	Irrational Drug	Hazardous Drug	Unnecessary Injection	Unncessary Drug
Total Sector	121	3582	2.8	1767	680	376	851	1698
(%)		(100)		(49.3)	(19)	(10.5)	(23.8)	(47.4)
Total Public Sector	59	1944	2.8	871	107	129	485	828
(%)		(100)		(44.8)	(5.5)	(6.6)	(24.9)	(42.6)
Rural Public	40	1234	2.6	521	73	69	262	456
(%)		(100)		(42.2)	(5.9)	(5.6)	(21.2)	(37)
Urban Public	7	271	2.8	141	6	11	67	133
(%)		(100)		(52)	(2.2)	(4.1)	(24.7)	(49.1)
Small Towns	12	439	3.0	209	28	49	156	239
(%)		(100)		(47.6)	(6.4)	(11.2)	(35.5)	(54.4)
Total Private Sector	62	1638	3.0	896	573	247	366	870
(%)		(100)		(54.7)	(35)	(15.1)	(22.3)	(53.1)
Rural Private	14	371	2.9	186	103	44	80	148
(%)		(100)		(50.1)	(27.8)	(11.9)	(21.6)	(39.9)
Urban Private	27	726	2.9	437	265	109	116	411
(%)		(100)		(60.2)	(36.5)	(15)	(16)	56.6
Small Towns	21	541	3.3	273	205	94	170	311
(%)		(100)		(50.5)	(37.9)	(17.4)	(31.4)	(57.5)
Average Zone	50	1481	3.1	719	279	179	317	749
(%)		(100)		(48.5)	(18.8)	(12.1)	(21.4)	(50.6)
Developed Zone	37	1058	2.7	506	174	95	231	493
(%)		(100)		(47.8)	(16.4)	(9)	(21.8)	(46.6)
Backward Zone	34	1043	2.6	542	227	102	303	456
(%)		(100)		(52)	(21.8)	(9.8)	(29.1)	(43.7)

Table No. A-4

Prescription Analysis of Doctors in Satara District

LEVEL OF RATIONALITY OF PRESCRIPTIONS
Sector-wise and Area-wise Comparison

Sector	No. of visits to Clinics	Total Cases	Grading of prescriptions: Rational (R)	Semi-rational (S)	Irrational (I)	Avg Score per RX (out of 30)
Total Sector	121	3582	651	1327	1604	14.22
(%)		(100)	(18.2)	(37.0)	(44.8)	(47.3)
Total Public Sector	59	1944	424	752	768	16.14
(%)		(100)	(21.8)	(38.7)	(39.5)	(53.8)
Rural Public	40	1234	264	476	494	16.22
(%)		(100)	(21.4)	(38.6)	(40.0)	(54.07)
Urban Public	7	271	86	108	77	16.34
(%)		(100)	(31.7)	(39.9)	(28.4)	(54.47)
Small Towns	12	439	74	168	197	15.76
(%)		(100)	(16.9)	(38.3)	(44.9)	(52.53)
Total Private Sector	62	1638	227	575	836	12.52
(%)		(100)	(13.85)	(35.10)	(51)	(45.06)
Rural Private	14	371	56	138	177	14.42
(%)		(100)	(15.1)	(37.2)	(47.7)	(48.07)
Urban Private	27	726	94	256	376	12.55
(%)		(100)	(12.9)	(35.3)	(51.8)	(41.83)
Small Towns	21	541	77	181	283	11.36
(%)		(100)	(14.2)	(33.5)	(52.3)	(37.87)
Average Zone	50	1481	290	514	673	14.23
(%)		(100)	(19.6)	(34.7)	(45.4)	(47.43)
Developed Zone	37	1058	175	392	466	14.77
(%)		(100)	(16.5)	(37.1)	(44.0)	(49.23)
Backward Zone	34	1043	180	409	454	13.99
(%)		(100)	(17.3)	(39.2)	(43.5)	(46.63)

Table No. A-5

Prescription Analysis of Doctors in Satara District

EXTENT OF UNDESIRABLE DRUG USE
Education-wise comparison

Sector	No. of visits to Clinics	No. of Cases	No. of Drugs per Rx	No of prescriptions containing: More than 3 Drugs	Irrational Drug	Hazardous Drug	Unnecessary Injection	Unnecessary Drug
Total Sector	121	3582	2.9	1767	680	376	851	1698
(%)		(100)		(49.3)	(19)	(10.5)	(23.8)	(47.4)
All Consultants	16	504	3.1	290	166	25	29	252
(%)		(100)		(57.5)	(32.9)	(5.0)	(5.8)	(50)
Public	3	144	3	67	4	6	15	59
(%)		(100)		(46.5)	(2.8)	(4.2)	(10.4)	(41)
Private	13	360	3.0	223	162	19	14	193
(%)		(100)		(61.9)	(45)	(5.3)	(3.9)	(53.6)
All MBBS	72	2238	3	1055	266	176	572	1029
(%)		(100)		(47.1)	(11.9)	(7.9)	(25.6)	(46)
Public	51	1624	2.7	737	91	101	415	694
(%)		(100)		(45.4)	(5.6)	(6.2)	(25.6)	(42.7)
Private	21	614	3.0	318	175	75	157	335
(%)		(100)		(51.8)	(28.5)	(12.2)	(25.6)	(54.6)
All Non Allopaths	28	719	3.1	355	214	138	199	355
(%)		(100)		(49.4)	(29.8)	(19.2)	(27.7)	(49.4)
Public	5	176	2.8	67	12	22	55	75
(%)		(100)		(38.1)	(6.8)	(12.5)	(31.3)	(42.6)
Private	23	543	3.0	288	202	116	144	280
(%)		(100)		(53)	(37.2)	(21.4)	(26.5)	(51.6)
All RMPs	5	121	2.2	67	34	37	51	62
(%)		(100)		(55.4)	(28.1)	(30.6)	(42.1)	(51.2)
Public	0	0	0.0		0	0	0	0
(%)								
Private	5	121	2.2	67	34	37	51	62
(%)		(100)		(55.4)	(28.1)	(30.6)	(42.1)	(51.2)

Table No. A-6

Prescription Analysis of Doctors in Satara District

RATIONALITY LEVEL OF PRESCRIPTIONS
Education-Wise Comparison

Sector	No. of visits to Clinics	No. of Cases	Grading of prescriptions			Avg Score per RX (out of 30)
			Rational (R)	Semi-rational (S)	Irrational (I)	
Total Sector	121	3582	651	1327	1604	14.22
(%)		(100)	(18.2)	(37)	(44.8)	(47.33)
All Consultants	16	504	126	209	169	15.64
(%)		(100)	(25.0)	(41.5)	(33.5)	(52)
Public	3	144	60	55	29	19.65
(%)		(100)	(41.7)	(38.2)	(20.1)	(65.50)
Private	13	360	68	152	140	14.71
(%)		(100)	(18.9)	(42.2)	(38.9)	(49.03)
All MBBS	72	2238	437	851	950	15.34
(%)		(100)	(19.5)	(38.0)	(42.5)	(51.73)
Public	51	1624	342	638	644	16.30
(%)		(100)	(21.0)	(39.3)	(39.7)	(54.43)
Private	21	614	95	213	306	13.03
(%)		(100)	(15.5)	(34.7)	(49.8)	(43.43)
All Non Allopaths	28	719	77	224	418	11.28
(%)		(100)	(10.7)	(31.2)	(58.1)	(37.60)
Public	5	176	22	58	96	12.48
(%)		(100)	(12.5)	(33.0)	(54.5)	(41.60)
Private	23	543	55	166	322	11.02
(%)		(100)	(10.1)	(30.6)	(59.3)	(36.73)
All RMPs	5	121	11	43	67	10.09
(%)		(100)	(9.1)	(35.5)	(55.4)	(33.63)
Public	0	0	0	0	0	0.00
(%)						
Private	5	121	11	43	67	10.09
(%)		(100)	(9.1)	(35.5)	(55.4)	(33.63)

PRESCRIPTION ANALYSIS - SATARA DISTRICT

UNDESIRBALE DRUG - USE

Sector - Wise Comparison

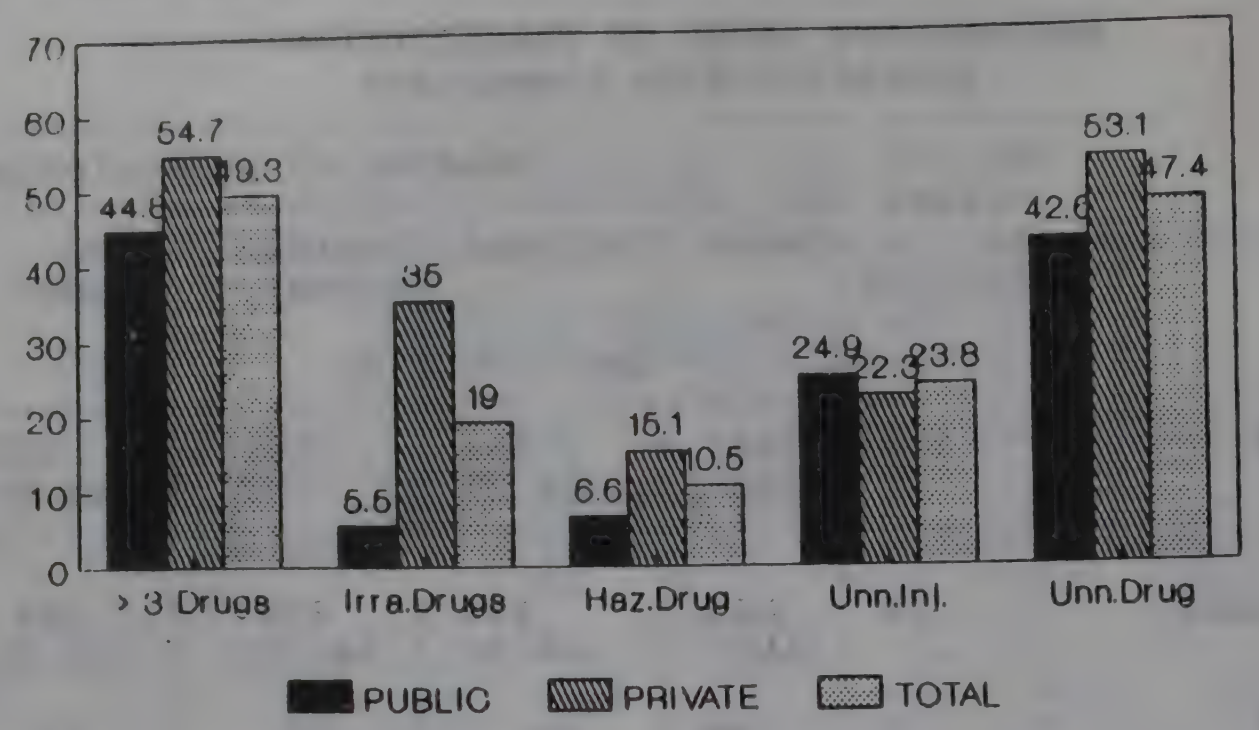


DIAGRAM 1

PRESCRIPTION ANALYSIS - SATARA DISTRICT

UNDESIRABLE DRUG-USE

Education - Wise Comparison

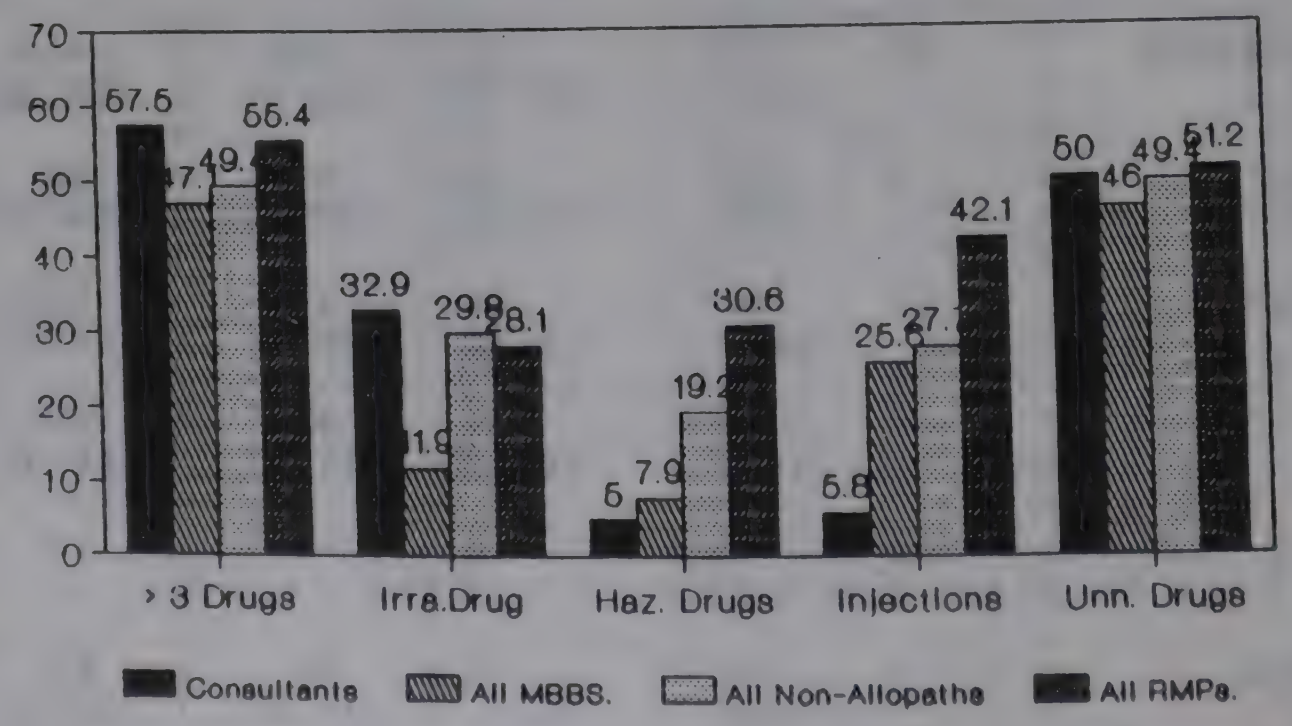


DIAGRAM 2

Prescription Analysis - Satara District

UNDESIRABLE DRUG - USE
Area - Wise Comparison in Private Sector

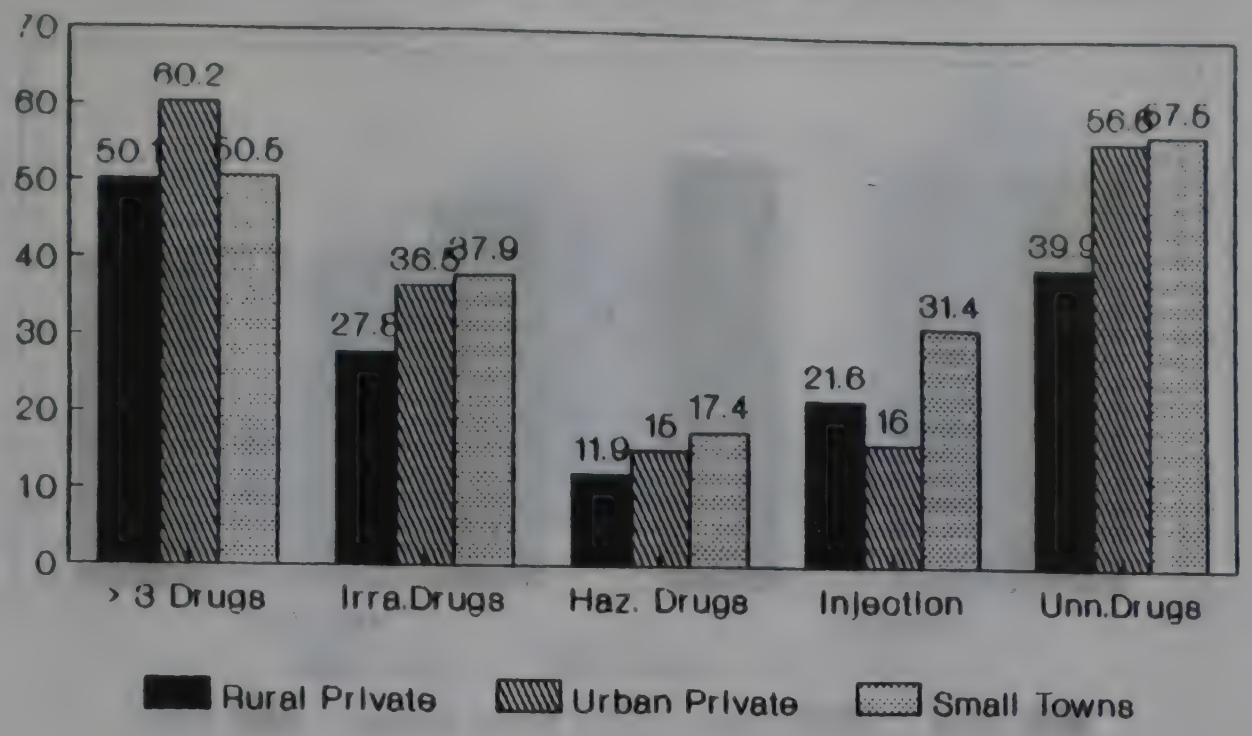


DIAGRAM 3

Prescription Analysis - Satara District

UNDESIRABLE DRUG - USE
Area - Wise Comparison in Public Sector

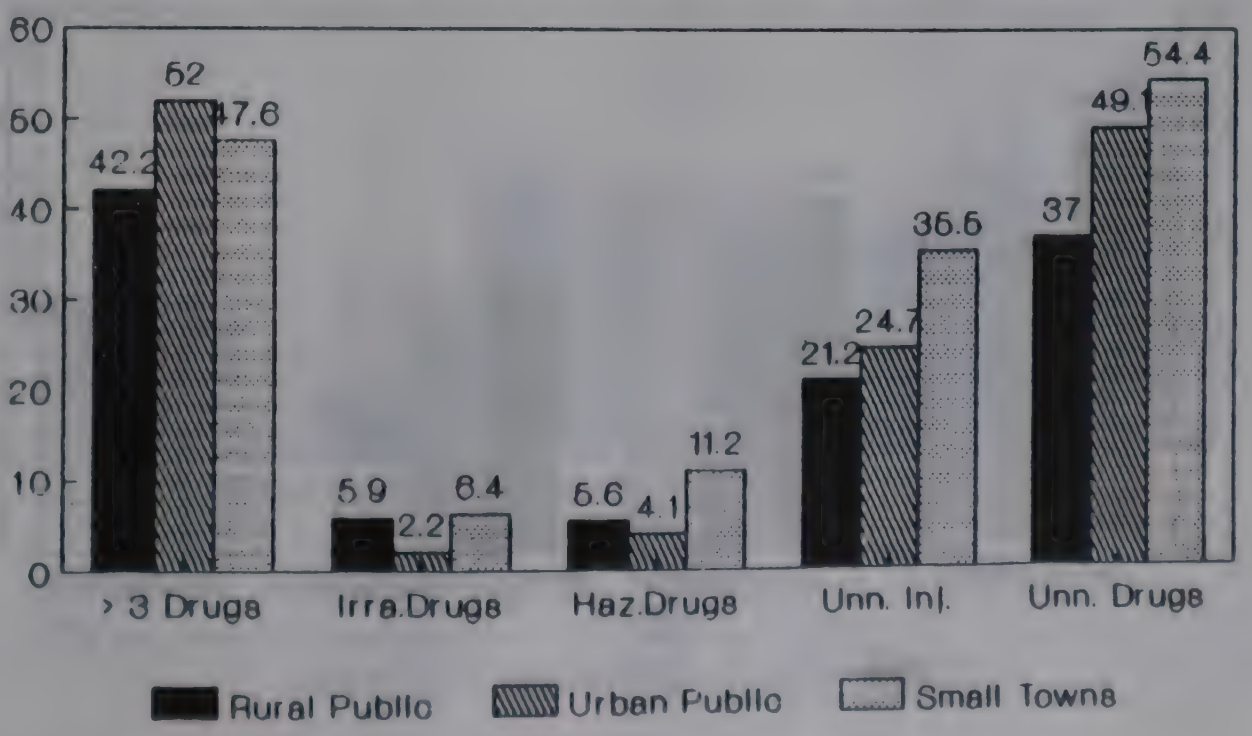


DIAGRAM 4

Prescription Analysis - Satara District

AVERAGE SCORE PER PRESCRIPTION
Area - Wise and Sector - Wise Comparison

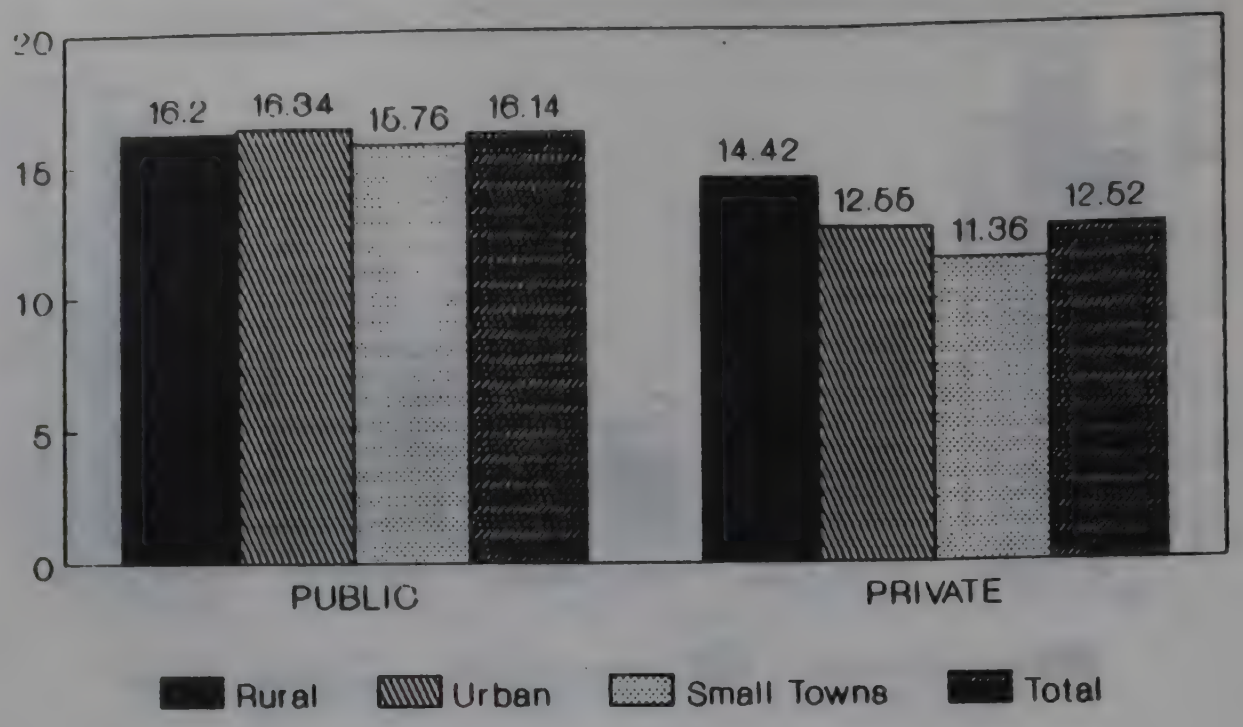


DIAGRAM 5

Prescription Analysis - Satara District

AVERAGE SCORE PER PRESCRIPTION
Education - Wise Comparison

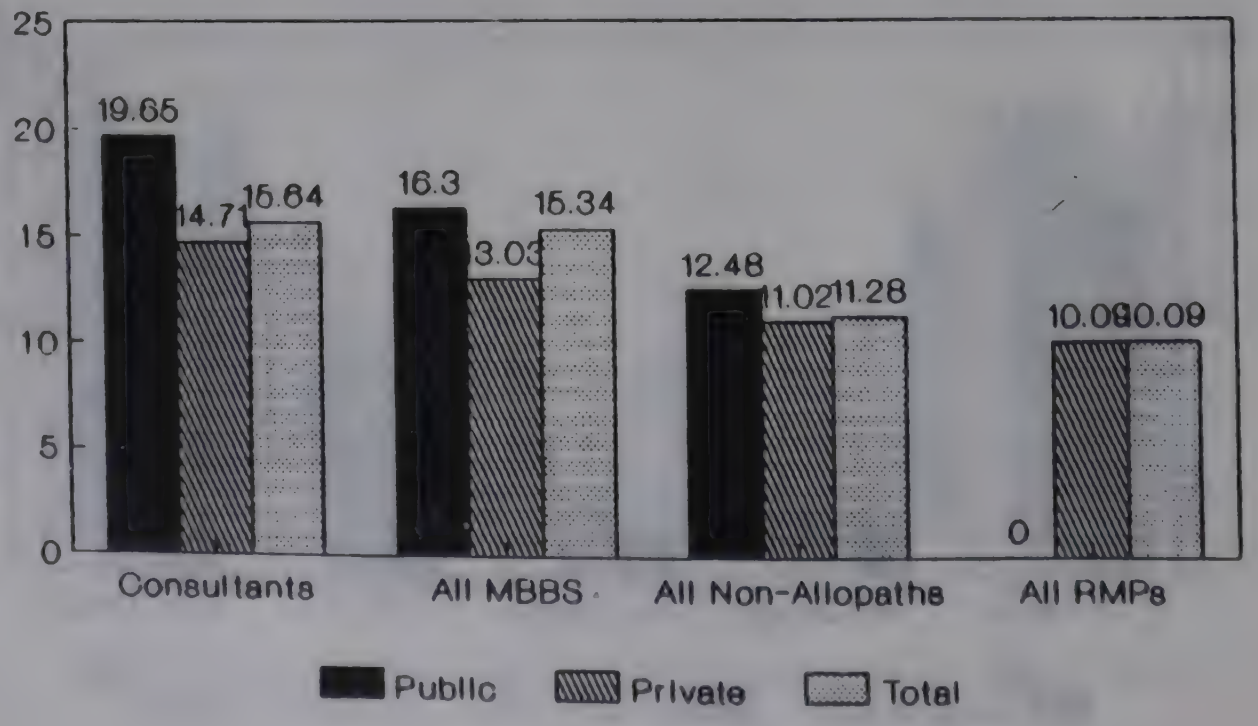


DIAGRAM 6

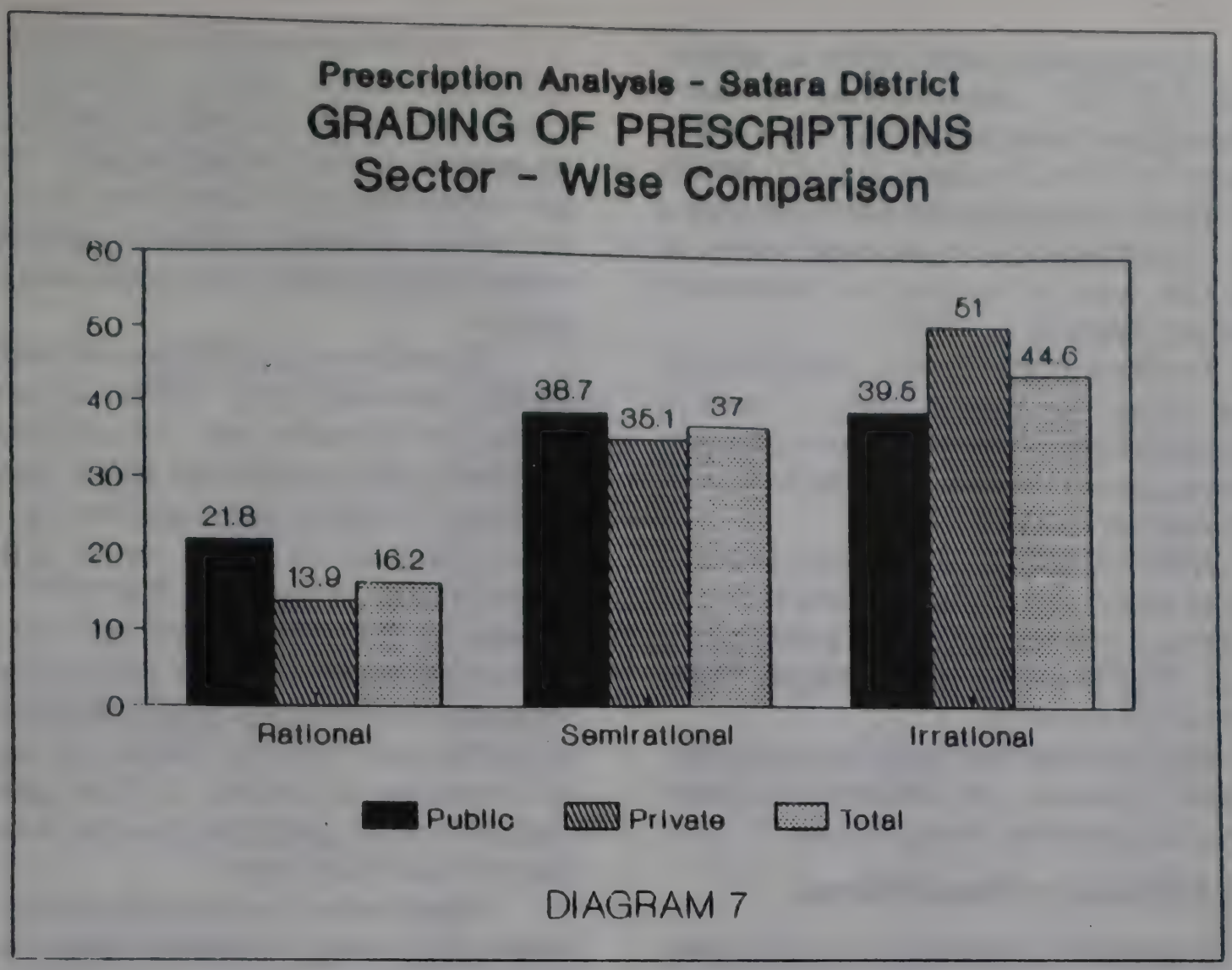


DIAGRAM 7

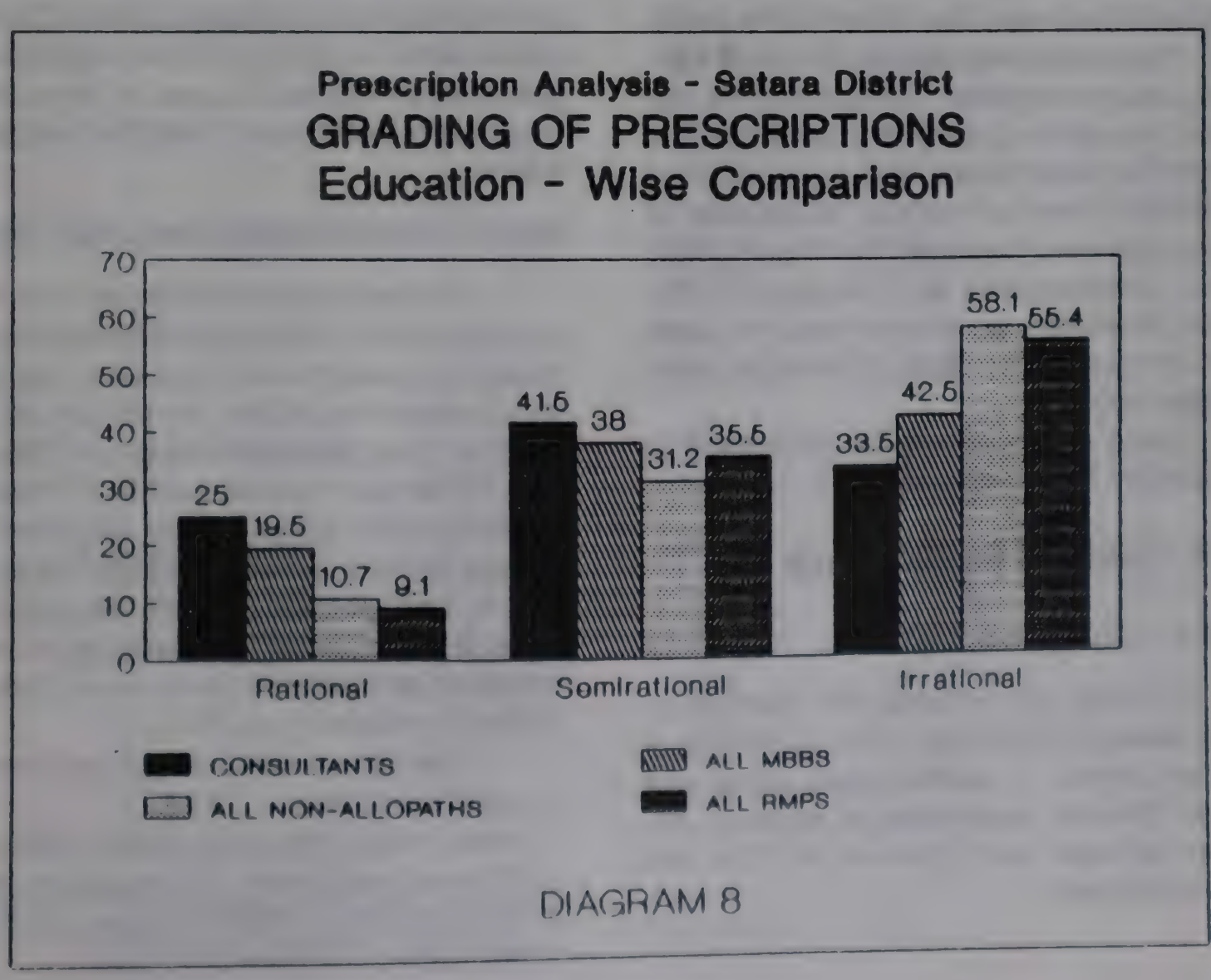


DIAGRAM 8

These scores also follow a pattern, (Table A-6) with prescriptions of RMPs registering the lowest score (10.09 out of 30), followed by Non-allopaths, (11.28), MBBS (15.34) and Consultants (15.64) in ascending order. The differences in average scores of these four types of doctors are statistically highly significant ($p <= 0.01$).

Amongst Consultants' prescriptions, those from the public sector have a significantly higher ($p <= 0.01$) average score per prescription (19.65), compared to that for the private sector (14.71).

Within MBBS prescriptions, average score of public sector prescriptions is higher (16.3) than these those of private prescriptions (13.03). This differences is statistically highly significant ($p <= 0.01$).

The same trend is seen amongst non-allopaths. However, the difference between the two is statistically not significant.

A- 5.3.6 Grading of Prescriptions

The relative proportion of rational,semi-rational and irrational prescriptions in the total 3582 prescriptions was 18.2%, 37% and 44.8% respectively. The proportion of rational prescriptions increased with educational qualification and was also higher in the public sector. The reverse was true for the proportion of irrational prescriptions. This grading, i.e. the relative proportion of rational prescriptions or of irrational prescriptions was not compared statistically amongst various categories of doctors. However, it appears that the rationality level of prescriptions as indicated by this relative proportion, generally shows the same trend as seen in the case of average score per prescription.

These results would be discussed in "Discussion" in sub-section A-6.4.

A-5.4 : Tests of Significance

A-5.4.1 : Chi-Square Test

In order to assess the statistical significance of difference in the proportion of different types of **undesirable drug use** across different categories of doctors, chi-square test was used. The results of the test were as follows :

The differences between i) public sector and private sector ii) Rural, Urban and Small towns within public as well as private sector as regards all the five undesirable drug use are statistically highly significant; ($p <= 0.01$) except the difference between proportion of unnecessary injection in the public and private sector.

The differences i) between consultants, MBBS, Non-allopaths, RMPs. ii) between public non-allopaths, pvt. non-allopaths. iii) between public and private MBBS and post-graduate doctors, are statistically highly significant, ($p <= 0.01$) for all types of undesirable drugs use **EXCEPT** those between i) Non-allopaths private and public doctors for hazardous drugs and unnecessary injections, unnecessary drug ii) MBBS doctors in public and private sector as regards unnecessary injections. iii) Post-graduate doctors in public and private sector as regards use of hazardous drugs.

Given below are the differences in the levels of rationality (as measured by these two indicators) across sectors (public & private), areas (urban, rural, small town), and educational qualifications. The third indicator - relative proportion of rational, semi-rational and irrational prescriptions - follows the same trend (table A-4, A-6) as for average score per prescription (except in case of consultants). Hence it has not been described separately below.

A-5.4.2 : Two Sample t Test and F Test

To assess whether differences in the average score obtained by different categories of doctors (sector-wise, area-wise, education-wise) were statistically significant or not, 2 sample t test was performed for differences in i) Public and private sector ii) Public and private sector consultants iii) Public and private doctors amongst MBBS doctors iv) public and private doctors amongst non-allopathic doctors. The differences in average scores in all the three cases were statistically highly significant ($p <= 0.01$).

The differences in average scores of prescriptions from
i) urban, rural, and small towns within public and private sector and ii) Consultants, MBBS, Non-allopaths, RMPs, were compared statistically by performing F test.

Table No. A-7

Average Score Per Prescription
For Most Common Diseases

Sr.No.	Name of the disease	Average Score per prescription (Out of 30)			Share in Total Morbidity (%)
		Private	Public	Total	
1	Contusion	20.5 (73)	21.9 (151)	21.5 (224)	10.47
2	Bodyache	12.9 (88)	18.2 (103)	15.8 (191)	8.93
3	Cold-cough	11.3 (69)	16.6 (80)	14.2 (149)	6.96
4	Diarrhoea	5.8 (67)	13.2 79)	9.8 (146)	6.82
5	Fever	15.9 (42)	16.1 (52)	16.0 (94)	4.40
6	URTI	11.8 (36)	15.3 (40)	13.6 (76)	3.55
7	Abdominal Pain	12.3 (27)	14.0 (47)	13.4 (74)	3.55
8	Malaria	18.4 (32)	16.5 (33)	17.5 (65)	3.04
9	Infected Wound	15.6 (37)	19.0 (22)	16.9 (59)	2.76
10	Dog-bite	23.7 (11)	22.7 (48)	22.9 (59)	2.76
11	Bronchitis	12.2 (29)	15.2 (23)	13.6 (52)	2.43
12	Gastritis	13.5 (30)	15.1 (22)	14.2 (52)	2.43
13	Weakness	6.2 (23)	8.2 (25)	7.2 (48)	2.24
	Total				61.24

Note - Figures in the bracket indicate number of cases. Total number of cases were 2138.

The differences in average scores in rural, urban, small towns, within public and private sector were statistically not significant, whereas those amongst Consultants ($p < 0.05$), MBBS, Non-allopaths and RMPs were highly significant ($p <= 0.01$).

A-5.5 : Disease-Wise Rationality Score

The results of analysis of disease-wise performance of Summer and Winter season prescriptions are as follows :

A-5.5.1 : Average Score for Most Common Diseases

Table No. A-7 gives average score per prescription for fourteen most common diseases whose combined share in the total morbidity load is more than 60% (60.05%). The grading of prescriptions for these 14 diseases is as follows :

Rational (25 to 30 marks) - Nil.
Semirational (15 to 24 marks) - 6 diseases.
Irrational (up to 14 marks) - 8 diseases.

The average score per prescription is 12.91 and 16.69 in private and public sector respectively with an overall average of 15.01.

Thus the prescriptions for even most common diseases are of a poor quality.

A-5.5.2 : Common Diseases With Irrational Prescriptions :

Table no. A-8, gives the list of diseases/ conditions whose share in the morbidity load at OPD is more than 1 % and who have received less than 15 marks; i.e. whose prescriptions are irrational. It also gives the respective marks scored by the prescriptions for these diseases, in ascending order, starting from the lowest marks.

It is seen from this table that most of the diseases whose prescriptions are irrational, are common diseases and not difficult, or rare diseases.

Table No. A-8

Common Diseases With Irrational Prescriptions

Sr. No.	Name of the Diseases/Condition	No. of Cases	Average Score Per Prescription
1	Anaemia	50	6.18
2	Weakness	52	6.75
3	Stomatitis	25	9.06
4	Diarrhoea	157	9.48
5	Bacillary Dysentry	37	10.19
6	Viral Fever	33	11.42
7	Asthmatic Bronchitis	30	12.17
8	Bronchitis	61	12.38
9	URTI	85	13.12
10	Arthritis	43	13.16
11	Abdominal Pain	83	13.72
12	Cold-cough	157	14.05
13	Gastritis	65	14.26

A-5.6 : Grossly Irrational Prescription

We came across many prescriptions which were grossly irrational. They contained either a totally wrong selection of the main drug or use of contraindicated drug or two or three analgesics or haematinics etc. In Table A-9, by way of example, we have reproduced 5 such grossly irrational prescriptions encountered in the collection of prescriptions during Winter, 1993. Twenty more have been reproduced in Annexure A-VII. This is only an illustrative list. Many more such examples were found.

It will be seen from this list, that all types of doctors, from RMPs in a small village to post-graduate doctors in a large town write grossly irrational prescriptions. This is shocking but unfortunately true.

Table No. A-9

Samples Of Grossly Irrational Prescriptions (From Winter Season Collection)

Sr. No.	Doctor's Degree & (location)	Patient's Age	Patient's Sex	Symptoms/ Clinical diagnosis	No. of drugs	Prescription
1	MBBS (PHC)	15	M	Skin diseases, worm infestation	3	Tab. Aspirin 1/2 tdsx2 days 1 BD x 2 days Syrup Ostocalcium 1 tsf tds
2	MBBS (PHC)	24	M	Cold, bodyache, cough	6	Tab. Actifed plain 1 BD x 2 Tab. Sepmax (cotrimoxazole) 1 BD x 2 Inj.Terramycin 2cc Tab.multivitamin 1 BD x 2 Tab. Aspirin 1 BD Mist Expectorant 2 tsf tds
3	M.S. (RH)	40	M	Burning micturition	3	Inj. Terramycin 1cc Tab.B'plex 1BD Tab.Aspirin 1 TDS
4	MBBS (PHC)	35	M	Acidity nausea, pain in abdomen	4	Tab.Gelucil (antacid) 1 BD x 3 days Tab.Macraberin (B'plex) 1 BD x 3 days Tab APC 1 BD x 3 days Tab. B'plex 1 BD x 3 days
5	MBBS (PHC)	45	M	Headache	4	Inj.vitamin C+ Cyanocobalamine Tab.paracetamol 1 BD x 2 Tab. B'plex 1 BD x 2 Tab. Calcium 1 tds x 2

(We have given a few generic names in the bracket)

A-6 : Discussion

A-6.1 - Sampling

A-6.1.1 : Broader Base

Barring the exceprion of Prabhashankar's study, the other two systematic studies published so far, of prescription practices of Indian doctors, are urban based. In Trisha Greenhalgh's study, prescriptions from a few Primary Health Centres were collected but the results were not included in the report published. Secondly there was no overall sample-frame for this study and no systematic randomization. The author visited some large towns in different parts of India and copied down prescriptions at OPD of large teaching hospitals, PHCs, General Practitioners and recorded sale of over-the-counter-drugs (without doctor's prescriptions) in some drug-stores in the cities she visited. The prescription practices were thus not studied across urban, rural, private and public sector, and across educational qualifications as has been done in the present study.

The study by Krishnaswamy et al is quite large, involving a study of 13588 prescriptions and 12362 OTC - sale-transactions in the twin city of Hyderabad and Secunderabad. It is not clear from the published study report, whether the sampling was randomized or not. Secondly, it is a purely urban study.

S. Prabhashanker, in her study, analysed 100 to 140 prescriptions of 5 to 30 doctors from Teaching hospital, District Hospital, PHCs General Practitioners, University Health Centres. Though the study is somewhat broad-based, it does not meet the WHO-INRUD requirement quoted below; and majority of the 576 prescriptions in this study are from urban-area.

Illustrative analysis of individual prescriptions have been published in various issues of the Baroda based "Bulletin of Society for Rational Therapy" and of the Calcutta based "Drug-Disease Doctor" - the quarterly magazine devoted for Rational Therapeutics. These case-studies are quite educative, but there is no question of sampling in such individual instances of prescription analyses. In the current study, our sample of prescriptions has been from both urban and rural area from an average district in Maharashtra. Secondly, we have taken care to collect prescriptions from backward, average and developed areas as well as across different educational backgrounds. We have, however, not randomized our sample. Randomization would have meant enlisting all the doctors in Satara district, area-wise, education-wise. This was not possible due to logistical constraints.

A-6.1.2 - Sample Bias

One specific bias has entered our selection - In our selection, more PHCs are from average zone. Since private prescriptions were generally collected from the same village, our private prescriptions are also biased towards average zone.

To assess whether this bias in selection of prescriptions significantly affects the results of the study, we analysed the data zone-wise also and the results of average zone were compared with the results of the backward and developed zone combined together. It will be seen from table A-3 that use of hazardous drugs is highest in average zone and use of irrational injections is lowest in average zone. These differences are highly significant ($P<=.01$). The differences for all other 4 indicators including those in the composite indicator of average score per prescription, are non-significant. Thus, the bias towards average zone in sampling does not significantly affect our overall results.

A-6.1.3 : Sample Size

We had no definite idea about the extent of undesirable drug-use by doctors. (This would have enabled us to calculate our minimum necessary sample size). We, therefore went by the following consideration put forth in the section "Methodological and Statistical Issues" in the "WHO Health-Facility Drug Use Indicators Manual". (WHO, 1992)

"The confidence intervals for any given sample size are always widest when $P = 0.5$. This proportion will therefore be considered as a worst case example. In order to achieve the desired level of precision of plus or minus 10% in the 95% confidence interval around a sample proportion estimated at 50%, a sample containing about 100 encounters is required.

The width of the expected confidence intervals estimated from a sample of this size decreases as the value of the proportion from the sample increases or decreases. For example, for a proportion estimated at 25% based on a sample of 100 encounters, the 95% confidence interval is 17.1% - 34.8%, a narrower width than for a 50% estimate based on 100 encounters. In summary, for the purposes of making facility-specific estimates with an expected 95% confidence interval of no more than plus or minus 10%, a sample size of 100 encounters is sufficient". (page no. 86).

"There should be a minimum of 600 episodes included in a cross-sectional indicators survey, with a larger number if resources permit. For a study of this size, an indicator estimated at 50.0% (the per-cent with the highest standard error) would have a 95% confidence interval of 45.9% - 54.1% , assuming no significant differences in practice among the facilities in the sample. Even if there were substantial differences among facilities (a frequent situation), the 95% confidence interval from such a sample would still be within plus or minus 7.5% much of the time". (page no. 82).

"Where there are a large population of facilities to sample from, at least 20 health facilities should be included in the sample for most cross-sectional studies. ". (page no. 82).

Though the total number of health facilities from which we drew our sample was not large, we decided to include 20 health centres and 600 prescriptions in our sample in public and private sector each. Though we were not able to collect 2400 prescriptions from the private sector as per our study-design, we have collected more than the minimum necessary 100 prescriptions from each sub-category of doctors. Thus our sample-size has been adequate.

A-6.2 : Rationality Indicators

A-6.2.1 : Other Indian Studies

Choice of indicators for assessing rationality of doctors' prescriptions is an important issue. Two of the three large systematic studies mentioned earlier, of prescription-behaviour of Indian doctors, have analysed rationality of prescriptions in an indirect fashion. Both studies (Greenhalgh, 1987, Krishnaswamy 1985) have analysed which types of drugs (antibiotics, analgesics etc) have been prescribed how frequently. This type of analysis cannot assess rationality of prescriptions directly unless it is based on the morbidity load in the clinics and appropriate Standard Drug Treatment Guidelines for these morbidities. This is a very demanding exercise and was not even attempted in these two studies.

Amongst these two studies, the study by K.Krishnaswamy et al from the National Institute of Nutrition, Hyderabad has also studied the following indicators - percentage of prescriptions containing date, age, sex, name of the patient, doctor's name and degree, instructions to patients and dose and, importantly, the diagnosis and duration of treatment in days. The observation in this study that a large proportion of prescriptions do not comply with the elementary requirements such as name, date, etc. points to the substandard nature of these prescriptions. But these elementary details are not the core of rationality aspect of drug-treatment. As regards the diagnosis, it is not necessary from the point of rational prescription practice, that diagnosis should be written on the prescription-chit given to the patient. It is necessary to record the main clinical findings and diagnosis on the case paper. But the NIN-study has analysed prescription-chits brought by patients to drug-stores and not case-papers as such. As regards writing dosage and other instructions to patients on prescriptions, this system is ideal. But absence of proper written instructions does not necessarily mean irrational prescription, since many doctors ask patients to bring medicines from the drug-store and explain orally which medicine is to be taken when and how.

It will be thus seen that the indicators used to study rationality of prescriptions in the two Indian studies quoted above, are indirect, inadequate and do not analyse the core of rationality of the prescriptions in relation to the diseases for which these prescriptions are meant. The study by S.Prabhashankar (Prabhashankar, 1982, pp 133 to 164) comes closer to ours. In this study 81 doctors from 5 types of health-facilities were given description of clinical profiles and diagnosis of 20 common conditions and were asked to write down their

prescriptions. However, no SDTRs were prepared for these 20 conditions. Prescriptions were analysed in terms of number, types and costs of drugs prescribed. This does not give adequate idea about the level and rationality of prescriptions. In her further analysis, S.Prabhashankar has also categorised drugs in these 576 prescriptions as essential, supportive, non-essentials. (Table No.25) But this also is not sufficient. It does not give an overall rating for prescriptions and does not say anything about use of irrational, hazardous drugs and unnecessary injections.

Our method of prescription analysis has advantage that

i> it analyses the *core* of the prescription and

ii> it analyses the rationality of prescription in relation to the Standard Drug Treatment Regimen for the disease for which the prescription is given; i.e. it analyses prescriptions in a *direct* way.

6.2.2 : WHO-INRUD indicators

The INRUD-WHO manual -How to Investigate Drug Use In Health-Facilities - has developed a number of indicators for studying drug-use in a community. It recommends 'core' and a 'complementary' drug-use indicators'. The 'core-indicators' include prescribing indicators also (see table A-2 below). This manual is the best source available on methodological issues in investigating drug use. But it also has the following limitations and deficiencies as regards the prescribing indicators it has recommended.

According to this manual, the particular indicators reproduced in Table A-10, have been selected because " they have proved to be both feasible to measure and informative as first level indicators"(WHO, 1993, p.10)

However, even as first level indicators some of INRUD indicators are unsatisfactory to assess the level of rationality of prescriptions precisely. The following paragraphs would clarify this.

A-6.2.2.1 : Average Number of Drugs Per Encounter

This indicator alone is insufficient because an average does not give an idea about the distribution of the variable.

Therefore, we should also see the **percentage of prescriptions containing more than three drugs**. Three drugs are generally sufficient for an outpatient case. More than three drugs are required only once in a while. Hence percentage of prescriptions containing more than 3 drugs is a good indicator of irrationality. This percentage is very easy to find out.

A-6.2.2.2 : Percentage Of Encounters With An Antibiotic Prescribed

In developing countries infectious diseases are the most common diseases and many of them require an antimicrobial. There are no data to say as to which level of antibiotic use (in terms of percentage of antibiotic containing prescriptions) is to be regarded as rational or otherwise. Secondly this permissible percentage would vary with the morbidity pattern

Table A-10

Core Drug Use Indicators

Prescribing Indicators

1 Average number of drugs per encounter
2 Percentage of drugs prescribed by generic name
3 Percentage of encounters with an antibiotic prescribed
4 Percentage of encounters with an injection prescribed p73
5 Percentage of drugs prescribed from essential drugs list or formulary

Patient Care Indicators

6 Average consultation time
7 Average dispensing time
8 Percentage of drugs actually dispensed
9 Percentage of drugs adequately labelled
10 Patients knowledge of correct dosage

Facility Indicators

11 Availability of copy of essential drugs list or formulary
12 Availability of key drugs

***source - WHO, 1993, p.10.**

which, in turn, would differ with season, geography, and socio-economic class of patients. A much better indicator would be **percentage of patients receiving one or more irrational drug combinations**. Except for about 20 rational drug combinations

recommended in standard pharmacology books, or those included in the WHO's essential Drug list (e.g ORS, O.C pill, Iron,+ Folic acid, etc.), all others are irrational. Irrational drug combinations are easy to identify; and they constitute the most numerous and the most predominant part of irrational drug-use. In the current study, this indicator of irrational drug use was therefore employed.

A-6.2.2.3 : Percentage Of Encounters With An Injection Prescribed

Some injections frequently used at out-patient clinics are quite rational - e.g. inj. Tetanus toxoid and other injectable vaccines, inj. penicillin or streptomycin (for tuberculosis) or inj. adrenaline for acute attack of bronchial asthama. Hence a proper indicator of irrational use of injections would be **percentage of encounters with an unnecessary injection given.** This indicator has been used in the current study. This indicator is not difficult to monitor by health workers if a 'black list' of commonly employed unnecessary injections (Inj. B1+B6+B12, Inj. Tetracycline, etc) and a 'green list' of rational injections as indicated above is given to the analyst. This would leave out only a small percentage of commonly used injections employed in out-patient clinics (e.g. Inj. metochlopropamide) whose necessity or otherwise cannot be easily determined by a non-doctor analyst. But such cases are quite uncommon and hence can be deleted from analysis without significantly affecting the results of the analysis.

A-6.2.2.4 : Percentage of Prescriptions Containing a Hazardous Drug

The small but well-known book " Banned and Bannable Drugs " (Voluntary Health Association of India, New Delhi, 1986) gives a list of drugs banned by the Government of India, including the major brand names of such drugs as well as a similar list of bannable drugs - drugs which have been banned or withdrawn from the market in many countries but still allowed in India. This list was used as the reference list for this study. Since this is a short list, it can be used easily by a non-doctor analyst. In our study, a more refined method was added to identify use of hazardous drugs. Guidelines were laid down (section C - ii in appendix A - II) to identify hazardous use of a rational drug e.g. use of aspirin in gastritis/peptic ulcer or use of injectable progesterone in first trimester of pregnancy.

A-6.2.2.5 : Percentage Of Prescriptions Containing Unnecessary Drugs

This is an important phenomenon, but not amenable to a "quick and easy " assessment of prescriptions being analysed. To identify the use of unnecessary drugs, Standard Drug Treatment Regimens for 91 common conditions encountered in these prescriptions were prepared as mentioned earlier. Any drug not included in the SDTR was considered as unnecessary. (However, any rational equivalent to a drug included in the SDTRs was not labelled as `unnecessary'). SDTRs are for average, uncomplicated cases . Cases which are considerably different from an average case would mean a different drug regimen from the SDTR given in Annexure A - I. e.g. in severe pneumonia, injectable penicillin is a must. Such allowance was made in analysing prescriptions.

A-6.2.2.6 : Other Indicators

In the current study, two INRUD - 'prescribing indicators' were not used - percentage of drugs prescribed by generic name and from essential drug list. This is because, half of the sample consisted of prescriptions from private sector wherein generic name drugs or essential drug list are not at all used. In India, non-allopathic degree/ diploma holders (Ayurvedic or Homeopathic etc.) many a times use allopathic drugs though most of them do not have any scientific training in allopathy. The extent of this "**cross-practice**" can be an indicator of irrational practice. We found that all non-allopaths in our sample used allopathic drugs without exception. Hence this indicator was not used to quantify levèl of irrationality.

Percentage of prescriptions advising Oral Rehydration Solution (ORS) in paediatric diarrhoea, is a good rationality indicator. We could not use it because surprisingly, we had too few cases of paediatric diarrhoea when we analysed our Monsoon data for this indicator, under the assumptions that we would

get more cases of diarrhoea in this season.

A-6.3 : Limitations Of This Method Of Prescription-Analysis

There are some limitations of this method of studying doctors' prescriptions -

i) Influence Of The Investigator's Presence

It was thought that when a pharmacist investigator is copying down the doctor's prescription by sitting beside him, the doctor would become conscious about his own prescription behaviour and would write better prescriptions. But in actual practice, we found that these 'consciously' improved prescriptions were by and large very irrational, and the marks obtained by these prescriptions were very low. This either meant that these doctors were not affected at all by the presence of the pharmacist-investigator or that they were unaware that they were prescribing irrationally or that in spite of their conscious efforts, these doctors were unable to improve the quality of their prescriptions.

ii) Wrong Diagnostic Terminology

There was no way to find out whether the diagnosis written on the case-paper was correct or not. This however, does not matter, because what we are studying here is doctors' use of drugs and not their diagnostic abilities. However, sometimes it looked as if the doctor was using wrong diagnostic terminology e.g. he wrote the diagnosis as "dysentery" when he meant ordinary diarrhoea; or "weakness" when he meant anaemia. In such cases,the prescription would get less marks, even though in fact, it was appropriate for "diarrhoea" or "anaemia" which was the operative diagnosis of the doctor, which was misnamed by him on the case- paper. There was no objective way to overcome such possibility. Such `suspicious' cases were however, exceptional, and hence would not affect the overall results of the large number of prescriptions analysed in the current study.

iii) Grossly Incomplete Diagnosis

Some case papers would just mention "Stomach-upset", "Cough" without giving any further details. Prescriptions of such case papers are difficult to analyse properly.

iv) Indoor Patients

Indoor prescriptions were not analysed. This is because in many indoor cases , definitive treatment is given only after investigations are complete. Secondly, the SDTRs for indoor cases would be different from those for outdoor cases. A separate study design would be needed for analysis of indoor cases.

A-6.4 : Results

Table No. A3 to A6 and corresponding diagrams clearly show that the performance of doctors from the point of view of rational therapeutics is quite unsatisfactory. Our systematic study has confirmed the general impression of critical observers that doctor's prescriptions are irrational to a sizeable extent. As pointed out earlier in section 6.2, the indicators we have used to assess rationality of prescriptions are better than those used in other studies. This is because these indicator assess the core of the prescriptions in a direct way by assessing the prescriptions in relation to the diseases for which they were given.

A-6.4.1 : Irrational Prescriptions In The Private Sector

It is nowadays fashionable to say that private health services are of a better quality than public health services and that there should be further privatisation of health services. But, the fact as it emerges from the study, is that private prescriptions are worse than those in the public sector. Two special features of the rationality level of consultants stand out clearly. Firstly, though consultants have the highest proportion of rational prescriptions, they tend to overdrug the patients, the most. Thus they attack the disease with a better prescription, but then also indulge into prescribing some fashionable, unnecessary medicine. Secondly consultants use less irrational injections because by tradition, consultants do not have an "injection practice"; consultants charging higher fees without giving an injection is socially accepted.

It is true that RMPs and non-allopaths generally get simple cases like coughs, colds and diarrhoeas, that too the uncomplicated lot. MBBS and consultants get more difficult

cases. Hence, comparing the scores of these categories of doctors may look problematic. But it may be pointed out that MBBS and consultants are better trained and hence should in fact be treating difficult cases and not merely simple; uncomplicated ailments. Hence a comparison of their scores with those of non-allopaths and RMPs without taking into account their different disease-profiles, is justified.

In the private sector, the doctor is afraid of loosing his clientele if there is no quick relief to the patient. There is, therefore, a pressure to use more drugs, the "latest" in the market, which is many a times unnecessary or irrational and hence wasteful. Similarly, in private practice, there is a tradition of paying more if an injection is given. Hence the rampant, unnecessary use of injections in the private sector. However, these compulsions of private practice should not act as justifications for irrational practive. There are many private practitioners who do not give unnecessary drugs or injections and still earn good enough on the basis of their expertise. Increased concentration of doctors; the aggressive unethical market strategies of the drug companies who even mislead doctors; consumerism in society, are all responsible for more irrational prescriptions in the private sector. These have been explored in some detail in section B. Broader structural reforms - an end to overproduction of doctors, to cross-practice, to urban concentration - etc. are needed to stop irrational drug use. A beginning can be made with compulsory continuing medical education after graduation; a full stop to the disinformation by drug companies; ban on cross-practice (use of allopathic drugs by non-allopaths); and medical audit of doctor's performance.

A-6.4.2 : Irrationalities In The Public Sector

It is also seen from the tables that irrationalities are less in the public sector as compared to the private sector. This is partly because the doctors in Public Health Facilities have to choose drugs first from the stock they have in their centres. These stocks are based on a standard list of mostly rational drugs. There is, therefore, not much scope for giving irrational drugs. As will be seen from the following Section-B, the doctors in public sector do not receive specific continuing education in rational therapeutics compared to private practitioners. The difference in rationality between the two, thus arises mainly because of the stock of rational medicines in Public Health Facilities. The other contributing factor is the lack of pressure of competition from other doctors as seen in the private sector.

There is not much pressure on the Public sector doctors from either the drug industry or the patients to over prescribe. Since public sector doctors generally ask patients to buy medicines only when a particular drug is not available in the stock, there are comparatively less of such "outside" prescriptions from public sectors doctors. The Medical Representatives of the drug companies do not, therefore, visit them so frequently. Many PHCs are located in wayside villages, which do not have any drug-store. Hence hardly any Medical Representative visits them.

Similarly, there is less of a pressure to please the patient and to give injections or tonics or stronger medicines in the hope of better, quicker relief. Yet, doctors in Public Health Facilities also indulge in a lot of unnecessary medication and injections. This is partly because, the "injection-culture", consumerism has engulfed the whole society and public sector can not remain immune from it. Lack of continuing education of doctors, of medical audit and accountability seem to be the prime factors for irrationalities in public sector. We found that in some PHCs, almost every patient would get an injection. This was purely out of indifference and lack of accountability. Some PHC doctors indulge in private practice in PHC-OPD itself. In such cases, there is a financial incentive to give more injections. But our proforma was not designed to record such private practice and hence we may have missed this phenomenon.

The special feature in public sector is irrationalities due to shortage of drugs. We came across case-papers where dog-bite cases in a PHC had not been given Anti-Rabies Vaccine, cases of anaemia had not been given iron but B'complex, malaria patients had not been given chloroquine, a patient of bronchitis had been given only B'complex; etc. A combination of shortage of drugs with irrational approach produced very

queer prescriptions which inflicted injustice on the patients.

One peculiar reason for irrationalities in public sector is irrational standard instructions by higher authorities. For example, as per standard instructions, every patient of fever is to be given 4 tablets of chloroquine as presumptive treatment, and a blood-slide is to be taken for examination for Malarial Parasite in Peripheral Blood Smear. A certain number of slides are expected to be made, depending upon the fever-rate. The Medical Officer, therefore off and on writes a diagnosis of malaria, takes a slide, gives 4 tablets of chloroquine and also treats the case with antipyretics and antibiotics! A large number of patients thus receive unnecessary and haphazard dose of chloroquine. Similarly, Ante-Natal cases are given only 100 tablets of iron and no calcium, as per standard instructions. Unless Standard Drug Treatment Regimens are worked out with a rigorously rational approach, such unintentional yet systematic and planned irrationalities would continue to plague therapy in public sector.

A-6.4.3 : Urban-Rural Difference

In general, services in urban area tend to be better because urban consumers are a vocal, influential layer in our society. However, in case of prescription-quality, the picture seems to be different. As seen in section A-5.3.3, the general trend (leaving aside insignificant and exceptional trends) in rationality indicators is that of worsoning of the quality of prescriptions in urban areas (large towns) as compared to that in the rural area.

This worsoning can be easily explained in case of the private sector. In private sector, there is a lot of competition amongst doctors. Doctors try to please the patients more, by giving stronger medicines, unnecessary injections etc., though this does not lead to better therapeutic results. Secondly Medical Representatives of drug companies are more active in urban area because it is easier to contact a larger number of doctors and influence them to prescribe more drugs to a class of patients who have more purchasing power at their disposal. Better availability of doctors, drug-stores, thus paradoxically results in worse prescriptions on account of unregulated competition amongst doctors and lack of medical audit. This is despite a more educated and vocal class of patients in urban areas. The need for regulated practice and medical audit stands out clearly here again.

This worsoning is a little difficult to explain because there is not much of a compulsion of commercial competition in the public sector. It seems however, that the overall culture of aggressive, irrational prescription-writing in the private sector affects the public sector also to some extent.

The prescriptions in small towns show the worst trend. (see A-5.3.3). It seems that small towns suffer from the disadvantages of both urban and rural area. Small towns are exposed to the urban trend of aggressive marketting by drug companies and at the same time, they have not come out of the illiteracy and the weak consumer resistance of the rural area. Hence patients in the small towns seem to be getting the worst prescriptions.

A-6.4.4 : Education-wise Differences -

As seen in section 5.4.5, as we gò up the educational ladder, i.e. from RMPs to Consultants, in general, the quality of prescriptions improves. However, the average score per prescription of consultants (15.64) is not significantly better than those of MBBS doctors. This is mainly because of the fact that in our sample, there is a far more higher proportion of private prescriptions (whose rationality is significantly lower than that of public sector prescriptions) amongst consultants as compared to this proportion amongst MBBS doctors.

Secondly, as seen in section 5.4.5 the indulgence in over-drugging, is significantly higher by consultants, compared to such indulgence by other, less educated doctors. On the other hand, the proportion of rational prescriptions by consultants is the highest and that of irrational prescriptions is the lowest. (Table A-4 and A-6). This means that, the consultants are significantly better in prescribing the appropriate main and complementary drug in correct dosages. But then they also indulge more in giving a couple of unnecessary, irrational medicines. In analysing the consultants' prescriptions, we got this same impression, as revealed by these figures. This over-drugging by consultants is perhaps a part of the fashionable culture in

the medical field.

A-6.4.4 : Disease-wise Rationality Score

It is quite revealing that the average scores per prescription for most common diseases are also poor. Secondly, amongst the diseases which have poor scores, common diseases figure quite prominently. This means that CME for doctors has to focus on rational drug-treatment of these common diseases.

A-7 : Conclusions

In general, the level of rationality of prescriptions in Satara district is quite low. The salient features of this overall scenario are :

1) The average score per prescription is very low. The proportion of rational prescriptions is low and of irrational prescriptions high in all types of doctors in spite of liberal guidelines used for analysis. The proportion of rational prescriptions and the average score per prescription rises with the educational qualification of the doctor. Though the overall score of consultants (post graduate doctors) is better, they tend to use more unnecessary drugs.

2) A very high proportion of prescriptions of all types of doctors contain irrational/unnecessary/ hazardous drugs or unnecessary injections or more than 3 drugs.

3) Public sector prescriptions are more rational than private prescriptions. However, proportion of unnecessary injections in the public sector is slightly higher than in the private sector.

4) In both public and private sectors, use of more than 3 drugs per prescription is highest in urban areas, whereas use of unnecessary, irrational and hazardous drugs and unnecessary injections is highest in small towns. In absence of consumer awareness and medical audit, better availability of drugs and doctors in small towns has paradoxically led to more irrationalities in prescriptions.

❑

Section-B

FACTORS INFLUENCING PRESCRIPTION-BEHAVIOUR OF DOCTORS

Background

In other sections, the present study tends to be medico-centric with its focus around doctors and their use of drugs. It looks at prescribing in terms of what is 'rational' and is determined by what is bio-chemically necessary for a patient during an episode of illness. Any difference from this is recorded as deviance. The sub-study in this section makes as attempt to understand the possible sociological basis for such deviance. Many studies on international health problems have given us some indications of human behaviour in the context of the health care available to them. A quick **review of various study results** which are contextual to the third world and India, give us an understanding and forms a background for the current sub-study.

In a review of anthropological research findings from 1951-1981. Foster (1984) describes one of the important conclusions of research studies of this period. According him, '...patients evaluate health care in terms of the alleviation of suffering, not cost/benefit ratios. **Clinical care**, not preventive measures, is the 'felt need' of health clients all over the world.' To substantiate this point, Foster quotes Minocha's illustration of Indian villagers. "They want a good curative service, and see prevention and promotion as secondary. The health administrators want people to reverse this order. The benefits of modern medicine are not being 'thrust down the throats' of unwilling villagers. The fact is that if most medical interventions in India are in the sphere of curative medicine, it is mainly because people want it that way".

Next the Kerepuram study (Kapil Inis, 1988) determines the private sector prescriber (2 MBBS, 1 licentiate medical practitioner, 2 vaidyas, 1 ANM with a private practice) to be **highly client-dependent**. The author describes them as seeking to maintain their professional identify. In the interaction between the prescriber and the patient, the patient is thinks of remedy and the doctor thinks of cure, therefore a remedy is reached.

A study in a Chilean health centre (1952) placed the interaction between patients and doctor as that of a **class divide**. The different convictions, by virtue of belonging to different classes hindered 'ready communication'. The study found that doctors and patients subscribed to two different systems of medicine, and each group was unfamiliar with the other's system; one being allopathy and the other a more culturally based system with 'hot' or 'cold' causes of illness.

More often we see the **implicit faith** of the patient in both traditional doctors, and modern practitioners. Patients more often do not understand anything of the treatment being meted out to them and place implicit faith in the healer.

Another documented facet of doctors' prescribing patterns is the tendency to over prescribe. Foster attributes the tendency to over medicate to the doctor's **uncertainty in diagnosis**. The other reason attributed to over-prescribing has been the **absence of adequate drug policies** (Helmut Kloos et al 1986). Foster also describes prescribing as influenced by what the patient can afford, and at the same time notes that the drug store also dispenses just that amount of the prescription which the patient can afford. The Kloos study goes on to explain that the strong cultural, social and economic barriers between people and physicians in developing countries are partly responsible for the greater role played by the less qualified pharmacist, druggist and retailer in the prescribing and dispensing of pharmaceuticals.

Several studies (Silverman et al, 1982;) record the role of the drug industry in

a. misleading the common practitioner and the general public about the efficacy of their products, side effects etc.

b. offering cash and similar incentives to the doctor to prescribe a particular product.

c. resultant imbalances between drug needs based on morbidity statistics and actual consumption.

During our visits to Public Health Facilities for data-gathering for the phase-I of our study, we observed that in the public sector, consistent short supply of drugs at public health units resulted in public sector doctors prescribing drugs to be purchased from the private drug store. Though, the doctor was required to record this on the case paper along with a quote 'own' (to indicate that it was being purchased by the patient) most doctors never bothered to do so. This was particularly so, in Primary Health Centres. Our experience in the Civil

hospital was somewhat better. More doctors there were inclined to note their 'outside' prescriptions on the case paper too. Also, talking to doctors revealed that they often did not record either the correct diagnosis or treatment on the case paper. As one **MO** at a rural hospital said, 'If a patient came to me with fever, and I do not have any drug to treat him with it, I write 'wound' and give him a tetanus injection. I have to give him something, otherwise he will not have any faith in me. I am forced to write the wrong diagnosis, otherwise anyone reading my prescriptions will think I am not a good doctor'.

These insights into the factors that influenced prescribing and prescription writing in the public sector made it imperative to seek, along with a technical analysis of prescriptions for their rationality, a more systematic qualitative inquiry into the complex social factors involved.

To Summarize the background in which prescribing, particularly, in the **private sector**, takes place, is

a. clinic based,

b. with the client-dependent prescriber who seeks to maintain a professional identity,

c. a tendency to over-medicate, either due to an absence of a coherent drug policy or an uncertain diagnosis or both,

d. an over riding influence of the drug industry through its marketing strategies.

In the **public sector** the influencing factors are,

a. availability of drug supply,

b. nature of clientele,

c. environment in which the PHC functions,

B-1 : Objectives

Through this study we proposed to understand,

a. the nature of Continuing Medical Education available to the doctor if any, in both the public and private sectors.

b. other social factors such as the social status of the doctor, nature and extent of other sources of medical services, geographical location of village where the doctor practices and any other constraints that might influence the manner in which he prescribes.

c. the manner in which the drug industry through its promotion campaigns, drug information literature, promotion campaigns, and incentives operates to influence the doctor practising in rural areas.

B-2 : Materials and Methods

This study is intended to be exploratory in nature as in India, there has been a lack of systematic inquiry into the social causes that influence a doctors' prescription. It was decided to employ a brief questionnaire to probe the factors influencing prescribing behaviour; for two reasons: one, we were not sure how doctors in the private sector would greet us, particularly with a questionnaire designed to analyse their prescription behaviour; and two, we hoped that the exploratory nature of the study would throw up sufficient data and hypothesis which could be explored later in a systematic manner. The lengthy discussions we had with experts and others researchers helped evolve a strategy that we expected would give the best results.
This sub-study was carried out in **two parts**.

Part I methodology and sample explored the gambit of factors that contributed to doctors' rational or irrational prescribing. **Part II** on the other hand benefitted by the rationality analysis of doctors' prescriptions (section A of the study), and their assigned rationality score. The same sample of doctors was used to correlate rationality scores with external factors such as geographical locations, in-roads made by the market economy and drug companies, as well as factors such as the doctors' own ideas about the need for Continuing Medical Education, the drug industry, patients' expectations and such like.

B-2.1 : Sampling

The two parts of the sub-study had separate samples. The strategy we adopted was - to keep with the geographical divisions that we had established during the first phase of our study, as developed, average, and backward talukas. In

sampling for **part I** of this sub-study, our aim was to interview at least 15 doctors in both the private and public sector in each of the three geographical areas. Private doctors operating in the same village or nearby villages were included in the private sector sample. The sample size in **part II** was determined by the number of prescribes whose prescriptions were collected for rationality analysis during the summer and rainy season. There were 35 in the private sector and 23 in the public sector, thus making up a sample of 58 doctors.

B-2.2 : Part I - Structured Questionnaire Plus Focussed Interview

As an entry point, we administered a small two page questionnaire (see Annexure B I). This was first pretested in Satara district with a random sample of ten PHC and RH Medical Officers. This was a short questionnaire and was estimated to take not more than 15 minutes of the doctor's time. The questionnaire served two purposes,

a. as an introduction to the doctor, and to develop an initial rapport.

b. to generate information regarding qualifications of the doctor, his/her sources of Continuing Medical Education, the number of medical representatives that visited him/her in a week, his/her views on patients' expectations, his/her opinions on drugs available in the open market.

With the help of this questionnaire, we hoped to initiate a detailed discussion with at least some of the doctors, by focusing on the broad guidelines we had worked out. The guidelines (Annex B-II) to the focussed interview included various probes for the investigators to find out more about the sources that public and private doctors had to Continuing Medical Education.

We envisaged that not all doctors would respond favourably, and with them we would only fill in the questionnaire, but where doctors seemed willing to talk, we would conduct a focussed interview.

B-2.3 : Part II - Questionnaire

To correlate the rationality score of doctors with certain socio-economic factors, we used a revised version of the questionnaire used in Part I of the sub-study. This questionnaire (Annexure B III) now also included specific questions regarding,

a. Doctors' opinions about medical companies and their practices on field,

b. the number of medical stores in the area,

c. the number of medical representatives that visited, and the pressure/ incentives exerted/offered to prescribe a particular drug

d. additional qualifications of the prescriber (including practical knowledge such as hospital training etc),

e. the peer pressure on the doctors,

f. the number of patients a doctor received per day etc.

B.2.4 : The Investigators

All the investigators had prior experience of health related research studies and field-work. Investigators worked in teams of two, (one male and one female), each team interviewing (in a day's work) at least one public sector and one private sector doctor. A one day training of investigators was done to orient them with the methods of the study. The investigators were also made to understand the gambit of factors that influenced prescribing, drug use etc, before each round of field work. They were provided in writing with the 'Broad Guidelines' (Annexure B-II) which listed various factors which influence the prescription-behaviour of doctors.

B-2.5 : Method for Collating the Data

The interviews were first translated into English, and then transferred on to WordPerfect 5.1. They were then coded into broad categories (such as CME, Patients' expectations etc), using Textbase Alpha. The sub-coding was then done manually.

The part-II questionnaire was coded and then analysed using SPSS.

B-3 : Results

B-3.1 : General

Our sample throughout was predominantly rural. In part I, we interviewed only six prescribers in the private sector. In part II, ten urban prescribers, and four public sector doctors were included. The random nature of sampling in the first part reflects

itself in the 'other' category. Here prescribers with out a valid degree (such as the two RMPs) and those with non-allopathic degrees are part of the sample. The degree-wise breakup of the sample is shown below.

Table B.1

Sample of Prescribers by Degree and Sector

	Public		Private	
	Part I	Part II	Part I	Part II
MBBS	12	14	1	10
BAMS/BHMS	1	4	23	9
MD/MS	2	2	3	4
RMP			2	—
*				
Others		1	6	3
			**	**
Total	15	21	35	26

* Others include Avv, Gfam, Mfam, Ghms, Dsaf, Dmpmms, Gceh, and Lceh.
** Actual number of respondents is the proposed sample size.

We found that all non-allopathy trained prescribers in this private sector, but one, prescribed allopathic drugs. The common response being that allopathy gives good results, or that the people want quick results/relief, and that homeopathy/ayurveda is used for chronic ailments only.

In part II sample, we found that years of practise had no bearing on the number of patients a doctor, or the number of Medical Representatives a prescriber received. Though rural townships (such as Wai, Mahabaleshwar and Umbraj) showed a higher number of patients per doctor i.e. minimum sixty. While urban areas such as Satara and Karad reported as high as 100 patients per day and a minimum of 30. Private sector doctors practising in rural villages such as Surur received an average of 12 patients in a day with a mode of 30.

Drainage population, which is the population that may come is the village for to seek medical care, has a bearing on both the number of patients received by a prescriber, number of Medical Representatives who visit as well as the number of medical stores situated. Practitioners in villages with drainage populations around 4000 or less have no medical store, report 12-15 patients per day, and 0-2 medical representatives visiting in a week. For larger villages and towns the proportion increases.

In the second part of this study we had proposed to co-relate rationality scores with the socio-economic surroundings of the doctor. The rationality scores however revealed that very little co-relation was possible as a majority of doctors had a very low rationality score.

Of the thirty-five prescribers that made up the private sector sample, only one (2.9%) fell into the category of rational prescriptions. For the public sector, the picture presented was not much better with only two doctors (though 8.6%) whose prescriptions could be considered rational. There was not much variation area-wise, though there seems to be a tendency towards a higher degree of irrationality in rural areas and small towns than urban areas.

B-3.2 : Continuing Medical Education

The study recorded doctors' responses regarding relevance and sources to Continuing Medical Education. The data include reasons why a doctor sees CME as relevant or not. It also includes all the possible sources prescribers may have to CME such as literature, lectures, and association-run programmes.

B-3.2.1 : Private Sector

a. Perceptions about CME

A major finding of the study is that there is a mis-understanding among practitioners as to the meaning of CME. A typical response of the private sector doctors when asked whether they had any opportunity to avail of CME would be "MRs come, they give samples, companies send us literature;" or, "medical journals, booklets are given free by the companies". The analysis of part I data revealed that 81.08% of the private sector doctors (N = 35) considered samples, booklets/pamphlets, product orientation and drug information as CME.

The perceptions of private practitioners about why CME is needed that emerged from both samples of the sub-study is given in table B-2.

b. Source of CME

The various sources of CME (in reality mostly drug information) that come the way of prescribers in the private sectors are

a. through literature supplied by the Drug Company, either in the form of pamphlets left behind by the Medical Representative (MR), or those sent through post;

Table B-2

Private Practitioners' Perceptions About CME

Why CME Is Needed ?	Frequency	
	Percent	Number
Knowledge about changing drugs and diseases	(31.1)*	19
Reorientation of existing knowledge	(9.8)	6
Learn about new techniques like Sonography	(14.7)	9
Learn about specialisations	(6.5)	4
Competition	(3.2)	2
Do not need CME	(27.8)	17
No response	(6.6)	4
Number of private sector doctors	(100.0)	61

* Figures in ( ) indicate percentages calculated over 61.

b. through journals and periodicals, both popular health magazines and those intended for doctors' CME;

c. through the doctors' association, which could be either a local level body or affiliated to a national level association such as IMA; (The Indian Medical Association);

d. for private doctors, particularly, an additional source could be seminars and symposia organised, again by drug companies.

Private doctors' : When asked as to whether they had any source of CME, 31.4% (11) answered in the affirmative. For 54.3% of private doctors, anything that the Medical Representative brought constituted CME, while the next most important source was association published periodicals received by 25.7% of prescribers. Periodicals such as Journal of Rural Pediatrics, Journal for Continuing Medical Education, British Medical Journal (BMJ) and Journal of Applied Medicine ... etc. were being received by 12.6% private sector doctors.

Though only 2.9% of doctors mentioned CIMS or MIMS as a source of CME, 51.4% private practitioners mentioned that they used the same in daily practice.

Drug companies were the largest single source of printed literature, periodicals and pamphlets received by 94.5% private sectors doctors. Only two doctors in the private sector said that they did not receive any material from drug companies. 80% (N = 35) of those who received drug company material found that the same useful. From the responses we can gather that private sector doctors learn about new drugs, trade names, composition, dosage, side-effects, and cost of drugs from drug company literature. They also learn about recent advances in medical sciences, through various drug company periodicals, that they receive either through the Medical Representative or by post.

According to the doctors interviewed, drug company literature also served as a 'reminder", an 'upgrader", and a source of 'enrichment' of knowledge for 37.1% of prescribers. Only 11.4% said that though they did receive the pamphlets etc, they did not have enough time to read or that reading was not a habit with them. As one doctor said, "Medical Representatives pay monthly visits. They give drug samples, printed material, but we have no time to read".

Drug company literature reached the prescribers entirely through drug company initiative, i.e., primarily through the Medical Representative (MR), when he visited a particular doctor, or by literature sent by post, or through advertisements in newspapers. A majority of doctors, i.e. 45%, received printed material from at least three drug companies, while 28.5% had the material of upto ten drug companies reaching them. **In part II** of the sub- study, we co-related the same with the doctor's practice. We found that those with a daily OPD of more than 30 patients received printed material of at least 6 drug companies and had a minimum of 4 Medical Representatives visiting them in a week. Those with lower OPD, in turn, had a lower contact with drug companies. A field observation was that many of the doctors linked Medical Representatives coming to them as a status-linked and in turn as a good practice.

Doctors' associations

57.1% of private sector prescribers were part of the local association, and 37.1% were also members of an all India association such as IMA. We recorded that 29.5% of doctors are not members of any association. As one doctor put it, "practical knowledge is different from theoretical knowledge". While, another said that she did not have the time to attend the meetings, particularly because they were held at night. In rural areas, all graduate and post- graduate doctors, irrespective of the discipline, formed the same association. The association, we gathered, is normally taluka based and the activities consist of regular meetings, mostly monthly (42.9%)

or bi-monthly (24.5%). The association in one *taluka* was non-functioning due to a conflict that arose between members.

The results of the sub-study show that the associations primarily serve as fraternal bodies where practitioners have a chance to meet and interact. Being part of the association was again status-related where RMPs were denied membership.

In Satara city we were told that drug companies funded association meetings, though, we were not able to judge the extent of the same in rural areas. Sometimes, lectures were held with the help of organisations like the Lions Club, or Krishna Hospital at Karad.

When queried about sources of CME, 40.9% of private practitioners (N=61) perceived the association as a source. Though when asked what purpose the association served, 57.3% reported the most significant use of the association as CME through guest lectures. For private doctors, this was an important source of CME, where the association invited guests lecturers and specialists from various fields, to speak on various topics. The responses noted that the lectures serve to refresh the memory, brought them up to date with the latest findings, current information, and kept them in touch with the outside world. These professional bodies would also discuss among themselves a difficult case, a new diseases or the effect of new drug formulations. Particularly, when it came to diseases like AIDs, most rural doctors seemed to have benefitted most from such talks and discussions.

Another 9,8% doctors mentioned that the usefulness of the association was the get-togethers and dinners that they had. For more than a quarter (26.9%) of private sector doctors responded saying, "to be frank there is no purpose in the association meetings".

B-3.2.2 : Public Sector

a. Perceptions

While all the Medical Officers (N=14) reiterated the in service trainings and the government published periodicals such as 'Arogya Patrika' and 'Centre Calling' as CME activities, at least five MOs did not perceive this to be CME. Drug company literature was perceived as CME by three, and association were a source of CME for five MOs.

b. Source

The major source of CME for public sector doctors was the trainings conducted by the Health Department. As one Medical Officer (MO) put it, "an MO gets training till he retires. Information regarding new diseases and advanced modalities of diagnosis and treatment is given eg. immunisation (3 days),

Table B-3

Doctors' Perceptions About Benefits of Being An Association Member (Private Sector)

	Rural	Urban	Total
Receive CME through Lectures	15 (31.2)	7 (53.8)	22 (36)
Learn about new products	3 (6.2)	4 (30.7)	7 (11.4)
Get togethers	10(20.8)	4 (30.7)	14 (22.9)
Exchange of knowledge and professional/legal problems	3 (6.2)	2(15.3)	5(8.1)
Able to treat patients better	0 (0)	2 (15.3)	2 (3.2)
Not any use	8 (16.6)	2 (15.3)	10(16.3)
Not member of any association	12 (25)	6 (46.1)	18 (29.5)
Total	48 (100)	13(100)	61 (100)

Figure in ( ) are percentage calculated total over number of respondents.

family planning (8 days)." This response is revealing, in that, though the Medical Officers are subjected to continuous 'trainings',the subjects are essentially limited those that constitute the national programmes.

As sources to Continuing Medical Education for a PHC doctor, the trainings/lectures conducted by the Department of Health services and literature published by the central and state health service departments are available to all. The first is compulsory, while the latter reaches all MOs even though they may not read it.

Literature : All PHC MOs received Arogya Patrika and Centre Calling. Both these were publications of the Health Education Department (State and Centre respectively). Some PHC MOs were members of IMA, (19.2%) and received the publication of IMA, and 15.3% were members of the General Practitioners' Association (College of GP).

Nearly three-quarters of the PHC doctors, i.e. 73.3%, (n=26) reported that they received the printed material pamphlets, and literature from drug companies. The investigators also noted that the Cipla courier was very popular among MOs, who proudly reported that their PHC received the same.

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Of these 75% found the literature "very useful". At the same time these Medical Officers also expressed regret about not being able to go through the drug company literature, though "they are supplied, ready and attractive with recent information". The inability to read this literature is placed on the nature of their jobs and the heavy work pressure due to national programme targets.

The sub-study recorded the range of trainings conducted as well as doctors' impressions of the same.

C. Trainings

At the time of fresh appointment and before he/she took over the PHC, the MO was required to attend a **"pre-placement"** training of one month. The subjects of this training included administration of a PHC, information about the running of National Programmes, with emphasis on family planning and immunisation.

Sometime in the early years of their service, all allopathy doctors employed as PHC MOs went through a **two month training in tubectomy**. Here, they were given surgical training inputs on how to conduct tubectomy operations. It was followed with a five day refresher course. Similarly, the immunisation programme was also given importance. PHC doctors mentioned that this was also a two month course which was followed up by a five-day refresher course.

Next most frequently mentioned were **miscellaneous** short courses like, the Oral Rehydration training for three days, a three day input on law and jurisprudence in medico-legal cases, etc.

The **monthly meetings** are compulsory for all the MOs, and are occasion when all MOs of a district come together. These though held mainly for administrative purposes, also serve as an educational class. Various bureaucrats in charge of the various National Programmes address these meetings. The in-charge of various departments, (eg. Malaria, TB etc) is expected to speak for half an hour. The DHO, the TB officer, the Malaria officer, the Civil Surgeon are among those who address the meetings. The content of this **address** remained vague to us. Some (4) doctors reported it as being technical inputs into a various disease programme, while others mentioned it as an evaluation of work done by that department, discussion on strategy to achieve targets.

This sub-study also records that earlier, monthly meetings had a test for MOs. One response explains. "They would give us a pre-set question paper and we had to answer it. For the last four years they have been doing this and only this year they could not do it". On probing, we found that no promotions etc, depended on the test. But this was a test purely to gauge how much information a doctor had absorbed during the discussions at monthly meetings.

Of medical and technical value were the various **"updates"** that were conducted for the PHC doctors. These included subjects such as Cardiac and Urinary problems as well as AIDs. These were normally a day long. **Workshops** are also held for a duration of 7 days, once in two years. These are conducted by the DHO, and in 1992 included topics such as AIDS and the National Health Policy. Health Officials also guide PHC staff when they visit the PHC.

Doctors' Associations

We found that three (out of 14) PHC MOs were also part of the associations formed at the local level, mostly initiated by private doctors. They actively took part in the organising of programmes, such as lectures etc, as well as in one place, the **chit fund** organised as part of the association activities. One of them said, "I attend meetings, lectures, seminars. Through them one learns about new findings in surgery, for e.g. on Ilizarov surgery, we got useful information". One doctor explained the reason for being part of the association as, more of our practical and day to day needs are looked after by the association".

MOs Views About The Training Received

Among PHC MOs 33% expressed reservations about these trainings saying that "there is a difference between the government training programmes and private training programmes (meaning those lectures arranged by respective medical associations). The trainings conducted in the public sector they felt, insisted on health programmes, whereas the private doctors' association held lectures which helped to "solve practical day to day problems". While some felt that there was an over emphasis on only some National Programmes and "that there is no refresher training programmes for leprosy and TB". While the need to be trained in administration (a task which takes up a large amount of time of PHC doctors) in addition, was also expressed by 20% of doctors.

Even though government doctors have regular trainings incorporated into their service, 15% of

doctors did not perceive this as CME. Trainings conducted by the Health department constituted the only source of CME for 65% of Medical Officers, while one MO said that he continued to refer to his old medical textbooks, and this was an additional source of CME.

B-3.3 : Cost of Drugs

B-3.3.1 : The Private Sector

The sales-campaigns conducted by the drug industry through Medical Representatives, promotional literature and advertisements have a predominant role to play in influencing the way doctors prescribe. But, at the same time we found that sometimes doctors hesitate to advise a new drug formulation that is being promoted, for reasons of cost. Drug prices was recorded as a major factor with private sector doctors with 60% of doctors (N=35) stating that drug cost influenced the way they prescribed. Forty percent said they looked at the patient's socio-economic status before deciding what drug to prescribe. While 31.4% private doctors said that the high cost of drugs is responsible for the patient not taking the full course of drugs prescribed. They also expressed fear of resistance to the drug arising from such a trend. One, recurring opinion expressed by doctors was that patients do not buy the drugs prescribed as they are priced very high, and this they feared, brought down their esteem as a doctor.

A few (4) even said that they gave the patient credit (i.e. a loan) to buy drugs, which they recovered back in installments or sometimes told their patients to buy the drugs first and then pay them their fees.

From the above, we can deduce that cost did affect prescribing in two ways. One, it made the doctors more cautious about whom they prescribed what drug (in terms of cost). Their status as a doctor depended on this. And second, cost was crucial in patients deciding whether or not to take what had been prescribed.

The rising cost also affected the prescribing pattern of the doctor, as we can see from the following response, ".....earlier I used to dispense drugs, but now it is not possible as the cost has become so high, that patients do not pay. Therefore I only charge for consultancy and prescribe drugs to be purchased". At the same time, we had the lone reply saying money was not the important factor. This doctor said, "I give first preference to the drug that needs to be prescribed. The patient will take a loan and get the money from anywhere". In the same interview the doctor went on to say, "I request the Medical Representatives to give samples to such patients who cannot afford the drugs; sometimes I ask the patient do you have money? I want to prescribe a `better' drug".

B-3.3.2 : The Public Sector

With public sector doctors, the cost of open market drugs seemed less of an issue, though the fact that open market drugs were costly, was mentioned by 53.3% of MOs. Here they mainly voiced their opinion on different companies selling the same drug under different brand names, therefore the same drug was then available at different rates. One response expressed the need for check on drug companies; saying there should be a limit "on how much profit they could make on one drug". The sub-study also noted the reaction of PHC MOs to irrational open market drugs. As one MO said, "Evaluation of protein and iron tonics for their usefulness should be done. Harmful drugs like phenylbutazone are still being marketed". Sixty percent of MOs specifically noted the price of antibiotics as being out of the reach of the middle class and the poor sections of the population.

"Outside drugs"

At the same time, Medical Officers prescribed drugs from the open market, colloquially termed as "outside" drugs, in varying degrees. They justified prescribing open market drugs for reasons such as,
— to make no compromise in quality;
— in important cases, there is a need to give branded, costly and outside drugs, and that,
— patient psychology had to be considered.
MOs admitted to prescribing injections and placebos depending on the patients' economic condition.

Our data revealed that the PHC MOs prescribed 'outside' drugs to OPD patients in the event of

a. the drug being unavailable in the PHC (57.8%),

b. to give a brand drug so that the patient got the impression that something new, or more potent was being prescribed (15.1%), and

c. for "important patients" (9%).

B-3. 4 : Availability of Drugs

The availability of drugs can be defined in terms of availability in the market, to the patient (i.e. location as well as cost), availability at the

drug store and the PHC.

B-3.4.1 : Availability in The Private Sector

Private sector prescribers did not feel that there were any shortage of drugs. 55.7% (n=61) felt that drugs were adequately available, except that, often they were made non-available to the patient as a result of being highly priced. In the private sector, doctors thus mentioned availability mainly in the context of cost. A typical response was "....poor people cannot afford the increase in cost of drugs", or "....antibiotic cost must be reduced .....it would then be more easily available". Or, "some companies give good drugs which are costly, the patient therefore cannot afford the same".

Substitution

Of the private sector respondents (n=65) 71.1% stated that the drug store substituted their prescriptions by the similar drug combinations of a different brand.

The major reason private sector doctors reported for substitution of their prescribed drugs at the medical store was that it was not available. Shortage and non-availability was expressed by 34.3% of private sector doctors as the first reason while another 19.2% said that medical stores substituted drugs because it was in their 'own interest'. These were also major reasons with 5.5% of public sector doctors. One PHC doctor expressed the opinion that drug stores substituted their prescription with 'near expiry' drugs.

When the medical store substitutes, half the doctors in the private sector 'co-operate' with the store. While another 23%, report that though there is an attempt to substitute, they do not allow the same, another 7.6% reported that they reject the substituted drug. As a check on substitution, only 3.8% of doctors reported that they call the patients back after purchasing the drug.

It was reported in one village that the medical store stocked only singular brands, thus forcing all the doctors there to prescribe the same, or to send the patient to the district place in case he/she was insistent on a particular brand. One doctor we interviewed was particularly resentful of the only drug store in the village; " ....drug companies especially CIPLA run schemes with medical stores".

Eleven private and three PHC doctors asked their patients to come back to show them what the drug store had given. One doctor said, "I do not write the doses on the prescription so that the patient has to come back after taking the medicine from medical store to doctor to ask him how to take the medicine". About substitution, another doctor said "I allow for a substitute of drug at times; but do not compromise over quality; especially in cases like enteric fever; I give only standard medicines from companies like Alembic and Sarabhai, Parke-Davis etc". Most often we found that doctors did not make an issue of substitution, if for instance a Boots brand was interchanged for a Sarabhai brand of the same drug. Both were well known and `standard" companies. The general feeling was if the drug was available, the brand really did not matter. That this was preferable than sending the patient to the nearest township to buy the same, was expressed by 40.6% of doctors, as travel added to the cost of the drug.

However, 35.5% of doctors did not approve of substitution with 'Bombay market' drugs. The doctor then would make an objection with the drug store. They reported, "we create pressure so that it is not given - we check to see if it is a good brand name". All the same the feeling is that they cannot send the patient to Wai or Satara as it was not economical. In two places we were told that the medical stores take down lists of drugs required from the doctor and stock those drugs.

The data shows that only 5.08% of doctors said they were very particular about their prescriptions being followed and not substituted. While 16.9% expressed inability to keep a check on medical stores, they also responded saying that they worked in co-operation with the medical store.

An urban doctor based in Satara said that even if the drug stores substituted his prescriptions, he was none the wiser, as the drugs stores were a distance away, and patients did not come back to show him the drugs.

B-3.4.2 : Availability in The Public Sector

The non-availability of drugs at the PHC is serious contention with 69.4% of government doctors. Availability of drugs at the PHC, or rather the non-availability is what encourages the Medical Officer to prescribe drugs from the open market.

For thirty-five percent of MOs, supply was ten percent of actual demand, while another 20% said this was because the drug budget had not increased while the prices of drugs had.

As mentioned earlier, all government doctors irrespective of their rationality scores prescribed drugs from the open market on one hand mainly for reasons of non-availability and inadequacy. Even then seven (35%) Medical Officer felt that drug supply in the public sector was adequate. Two

doctors (10%) felt that instead, the problem was that there were too many patients and another MO said adequacy of drugs depended on the manner in which a doctor prescribed.

Every second Wednesday of the month, a staff member of the PHC makes a trip to the ZP office in Satara with an indent for drugs they might require - but drugs come only as per stocks available with the ZP office. For instance they get oxytetracycline (an antibiotic) but no CPM (an anti-allergic). The study documents doctors' responses in 4 PHCs who said they bought their own drugs for which they then charged the patient.

One doctor complained that amoebiasis is rampant in his PHC area, yet Flaygl had not been supplied for a year. The study records the dissatisfaction of PHC MOs about non-availability of drugs like Perinorm (an anti-emetic), and CPM which are routinely required.

Some doctors also expressed the opinion that the quality of some drugs at the PHC is good, like Metrogyl for amoebiasis but the overall feeling (66.6%) was that the drugs supplied are substandard.

The responses of 55.5% PHC MOs demonstrate that they sometimes perceive shortages as the non-availability of brand drugs. The following response is a point in case. This MO said 'No Avil is available, therefore I give CPM along with a placebo injection".

That drug supply should be increased was mentioned by 72.2% (26) of MOs. Responses in the same light were - "Medicine from the District HQ/DHO comes to us in inadequate quantities. Patients are more and drugs are less. Therefore we are forced to ask for medicines from outside, write outside prescriptions". [1]

The knowledge that injections were not always essential was also expressed, but at the same time they felt that the same should be supplied to PHC/RH. The reasons for this included

* Patients demand the same
* They are needed as placebos
* Our status as doctors depends on it.

Rationalisation of Shortages

Three MOs (8.3%) explained that drugs were supplied in adequate quantities, they were short only "at times". And, we were told that in case of any problem, there was always the emergency kit which was fully stocked at all times. We also received clarifications saying "...its not like there is absolutely no stock - we normally have Paracetamol, Septran; but drugs like Ampicillin, Tetracycline are in short supply".

One doctor referred to shortages as a 'wrong impression'. He explained that drugs were not stocked for those complaints that occurred once in a way", or for those illnesses that were not very common. "There is one Coronary Heart Disease (C.H.D) patient in a thousand. That is why we do not store drugs for such complaints. This is the work of consultants". The feeling was that people do not think of this. What is the use of keeping drugs to treat patients of Diabetes, Blood pressure, C.H.D. We prescribe drugs from outside for such patients. Even then we do so only where it is a necessity, whereas private practitioners prescribe even where it is not needed".

Another doctor compared the drug supply to the Public Distribution System (PDS; ration shops) saying, "...but you know the way ration shops are run - once in away when you want kerosene then it is not available - people must accept such situations".

That the PHC's main function was preventive and not curative was a reason put forth by an additional 8.3% MOs and therefore non- availability of drug was not be made an issue of. One response said, that there is absolutely no shortage of drugs at the PHC, explaining that they get stock from the ZP whenever needed. "If saline is over, then we are allowed to buy locally - i.e. in emergency cases; last year there were two epidemics; two villages had gastro; the ZP then made supplies immediately". Another doctor even said, `we are morally bound to the government therefore we do not purchase outside drugs". But at the same time we found both these doctors still prescribed drugs from the open market for patients that came to the PHC.

Differential Treatment to Cope with Shortages

One PHC had adopted its own method of dealing with drug shortage by prescribing drugs on the basis of the contraceptive status of the patient. On the initiative of the MO, all the case papers had special rubber stamp columns, which filled in information regarding the contraceptive status of the patients who came to the PHC OPD. The patient was asked how many children he/she had, if he/she had undergone the sterilisation operation or not, and if yes then after how many children. Looking at this information the doctor then decided what drug to

[1] We have quoted the doctors verbatim without editing the style or the grammer.

give, giving the most preferred treatment and rationing out more expensive and the less frequently available higher drugs and antibiotics to the patient who had undergone an operation after one child, or to the patient who was the only child. Those with more children were doled out the more cheaper and more commonly available alternatives such as aspirin etc. He justified this saying that this single child and its family was an asset to the nation, and that one should make sure that nothing unwanted happened.

B-3.5 : Medical Representatives

Thirty-Five (57.4%) of the prescribers in the private sector sample and fifteen (51.6%) MOs that we visited, answered in the positive, to whether Medical Representatives visit them or not. The range was a maximum of 60 MRs reported visiting in a month, to a minimum of 5-6 every month. This excludes the two doctors who reported only 2-3 MRs visiting them in a year, and those that do not receive MRs at all (15.3% of sample). The data showed a direct ratio between the number of MRs visiting and the number of daily patients a doctor got, irrespective of the area.

Among the irrational doctors, (as rated in section- A of our study), a larger percentage of them (68.1%) thought that the visit of Medical Representatives was useful and beneficial to them. The major reason for this was they got to know new products (53.8%), while a few (7.6%) felt that MRs provided them with technical updates.

Majority of **private sector doctors** (61.5%) said Medical Representatives influenced their prescribing. Medical Representatives succeeded in influencing doctors to change their brands in 38.4% of cases, while 7.6% of doctors said they changed brands only after trying out the drug on some patients. If it proved successful then they proceeded to prescribe the same as standard prescriptions.

Government doctors as a rule did not receive more than 5 Medical Representatives per week. Half of all MOs (13) found the visits of MRs beneficial, and all of them said it was because they were informed of new products, 45% also agreed that MRs influenced their prescription writing; of which changing brands contributed 44.4% and 22.2% tried out the new drugs suggested by MRs.

The sub-study records the MR related factors that play an influencing role on a doctors' prescribing

a. the relationship a doctor developed with the MRs who visited; this ranged from good public relations to appealing to the doctors' educated status, and therefore a one to one relationship.

b. 20.6% of doctors (in both sectors) reported that the persistence of the MRs mattered. Their repeated hammering on the doctor about the use of their company drugs had an impact. But all the same, most doctors reiterated "I think on my own and decide properly after knowing the results of those drugs", while some insisted that they think also of the side-effects and only then prescribe, while also trying to find out the other doctors' opinions and their experience of the use of such drugs.

There seemed to be an agreement among doctors that the detailing of MRs was useful. This was because,

a. they receive knowledge about medicine, their use and dosage,

b. they learn about and hence can avail of schemes and incentives that the MRs offer, in the form of cash savings, gifts etc.

c. they receive essential knowledge regarding a certain drug, and therefore can change treatment depending on the patient,

d. detailing is beneficial as one does not get time to read rest of the literature,

e. they can then test the results of the drug; if it is good enough to start with standard prescriptions (to all patients). The doctor also get to know a new medicine with knowledge of the results,

B-3.5.1 : The targeting of prescribers

We realised, while on field, that the MRs did not visit all the doctors practising in the same village. They visited only those doctors with a higher patient ratio, and only in villages where there was a drug store. However, we were not able to verify the same. We asked doctors who did not receive MRs (6 private, 7 public), why this was the case. The responses elicited were,

a. now companies give guidelines to MR's to visit only articular number of doctors in an area;

b. now the number of practising doctors has increased in a area. Therefore frequency of MRs visiting has come down;

c. earlier MRs used to literally force a doctor to prescribe but now that was not the case;

d. MRs visited doctors where Medical Stores existed, and where they had the capacity to stock a larger number of drugs.

e. one doctor also informed that since he practices in four villages, MRs do not find him and

f. another said that he was old now, and therefore they did not visit him.

B-3.6 : Competition

B-3.6.1 : Too Many Doctors

Rural private sector doctors practising in villages and taluka towns etc. do not always find it easy to practise and draw patients. 31.1% (19) of the doctors expressed that the number of patients they were receiving had fallen over the years. They attributed this to an increase in the number of doctors now operating in same the area. They related examples saying that when they started practice fourteen years ago, they were only five or six doctors. Now there were sixty doctors operating in the same area. Or, that ten years ago, there were three ENT doctors operating in Satara, but now there are eight. Now they had to prove themselves in the eyes of a patient to attract more patients to them. Since this has a direct-impact on their earning; doctors are seeking ways to please the patient and be competitive in the market.

B-3.6.2 The Consultancy Phobia :

Another significant factor that influenced prescribing behaviour, we were told, was that patients have changed their expectations of doctors. Private sector doctors (11.4%) mentioned that there was a growing tendency of people to go to a specialist such as an MS/MD. This also they narrated, had an adverse impact on the general practitioners' (GP) practice. Patients did not mind spending money on the drugs prescribed by the specialist/consultant, as well as pay him Rs 50.00 for his consultancy. But at the same time they resented paying a GP his charges, even though he advised, dispensed, as well as prescribed and then charged only Rs 10.00. This change in attitude of patients, was narrated to us with much bitterness by such private sector doctors who felt that the increasing presence of postgraduate doctors and consultants had changed the environment in which they practise. One doctor even said he does not refer any patient, because he does not know whether they would come back to him. And, then if he needed to refer patients, he referred them all the way to Pune. This could result in a change in prescribing habits of graduate doctors, who as we were also told (81%) tried to imitate the style of consultants by charging a certain fee and feeling compelled to write down a prescription and not to dispense.

B-3.6.3 The Demise of the Family Doctor :

The overall impression we had from the responses elicited was that the old system of "family doctor" did not exist. When asked, some of the doctors placed the blame squarely on the shoulders of the Post-Graduate (PG) doctors saying that firstly, there were too many of them; secondly, that people's knowledge of the existence of PGs make a difference to their own status as GPs; and thirdly, PGs are "fee" and "status" conscious. All these factors they claimed, resulted in patients going directly to postgraduate and consultant doctors feeling that an ordinary GP does not prescribe as well and does not give as potent drugs. This the GPs felt, very often simply translated as more expensive drugs.

This status of General Practitioner/Consultant etc. made a difference, on prescribing behaviour was something that was expressed by 16.3% of doctors. Consultant doctors prescribe drugs from outside. The status of the doctor also determined what kind of patients came to them and what kinds of medicines are prescribed to them. We were told that the village heads, such as the sarpanch, the police patil and others belonging to the high income category went to specialists and that "they did not like to come to a GP".

B-3.6.4 Patients Decide :

As per the perception of doctors, "patients decide" which doctor they should go to.They feel this particular doctor has "ghoon" and that therefore they should go to him. But if they did not feel better immediately, then they tended to change the doctor immediately and go to someone else. Most doctors seemed to be aware of this, saying that a small percentage their patients always went to other doctors and those from other doctors came to them. This did not seem to reflect badly on their overall practice.

It was our impression that there has been a growing pressure on doctors to "stay in business". Some doctors mentioned it, and said it had an effect on their prescribing ways. They were more conscious of the fact that they needed to please the patient. Some doctors used quite strong language when they explained their practice as "one has to hunt for a market", or the doctor who said, "as a result of competition, the patients are misguided. At these times the medical field is not good. It is like the business of a prostitute. There are no ethics".

B-3.6.5 "Professionalism":

This became clear when some of the doctors

in our smaple, responded saying, I have to be "professional". "Professional" was translated in practice to mean the giving of prescription, injections and admitting the patient without a valid medical reason. We observed at least four to five private doctors who did this. One doctor blatantly put the reason for this as, "my family spent six lakhs for my education; I will have to be `professional' to recover the same".

B-4 Summary of Results

Reviewing the results of both parts of the sub-study, we come to the following Summary of our findings :

Our experience on field was quite positive. We found doctors, particularly those based in rural areas, largely co-operative and willing to speak. Urban doctors, though, we felt were less forthcoming.

B-4.1 CME in the private sector is entirely left to the discretion of the individual doctors and only 12.6% subscribed to periodicals other than those published by medical associations and drug companies.

B-4.2 The health services conducted trainings at frequent intervals for Medical Officers in the public sector, though these mainly stressed and centred around the implementation of national Programmes.

B-4.3 The drug company propaganda, through its printed literature (i.e. pamphlets and periodicals), and Medical Representatives forms the most important source of "Continuing Medical Education" for doctors. Though this may be termed as promotional literature and therefore biased, it receives the sanction of more than 68.1% of private and 50% of public doctors as being a source of education.

B-4.4 The local medical associations in rural areas served as link between private doctors within a taluka, a link with the outside world through inviting of specialists and senior doctors from bigger cities as guest lecturers. It also served as a fraternal body discussing issues facing doctors such as the Consumer Protection Act etc.

B-4.5 Visits by Medical Representatives significantly affected the prescription - behaviour of doctors.

B-4.6 No medical officer in the public sector reported to receiving any medical journal other than that received by virtue of being a member of the Indian Medical Association.

B-4.7 Cost influenced prescribing patterns in a significant way. Rising costs of drugs have resulted in doctors changing the manner in which they dispense drugs. Though prescribing an expensive drug carries with it a higher status; doctors are cautious that the cost of the drug is not out of the purview of the patient as it may work negatively in the case of a poor patient.

B-4.8 There is considerable substitution of drugs by drug stores. Doctors did not mind their prescriptions being substituted by brands of 'standard' companies such as Glaxo, Cipla and Sarabhai. Though doctors felt that it overrided their status; most sought to overcome substitution by 'cooperating' with the medical store.

B-4.9 Rising costs of drugs was also making it difficult for a doctor to dispense drugs as well as charge a fee. Some doctors therefore resorted to dispensing less and prescribing more.

B-4.10 In the public sector, availability of drugs from mainly a rational drug list means better prescribing practices as seen from the results described in section-A of this study. However, the drug-supply to PHCs is inadequate and irregular. Low availability of drugs at the PHC meant that all MOs were compelled to prescribe drugs from the open market. However, MOs also considered the socio-economic profile of the patient, prescribing 'outside'and 'better' drugs for 'important' patients etc.

B-4.11 : Geographical clustering of prescribers in larger villages and small towns has led to private doctors seeking ways to draw and keep patients, leading to a change in prescribing habits. Increased need to 'please the patient', to administer placebos, in the form of unnecessary injections, drugs, or the prescribing of more expensive drugs to appease the patients' notion 'the more expensive medicine the better it is'; these are all strategies to keep a clientele with them.

B-5 : Discussion

Our sample-size for both the private and

public sector is adequate. In **Part I,** 20% of MOs in the public sector, and approximately 5% of doctors in the private sector were interviewed. (This is assuming that the MR estimate about of 800 doctors practising Satara district is correct). In the second round another 25% and 3% were interviewed in the public and private sector respectively.

The importance of the study falls into two areas. Firstly, for the first time in India has the systematic recording of provider views been done. And secondly, the methodology used has its advantages in the randomness of its sampling as well as for its survey style. At the same time the study is only exploratory and secondly, it neglects the more complex factors that influence prescribing such as the personal characteristics of the providers as well as other factors like education, social class, etc. that may provide personal motivation. However, on the other hand, the methodology adopted here brings forth the general homogeneity of providers as a social group. Broad divisions such as public, private, urban and rural suffice. The homogeneity in which prescribing takes place is transparent in the findings. The all-pervading influence of the drug industry, rising cost of drugs, the lack of control on prescribing ways ...this has the sanction of the rural prescribing community. The arrival of 'newer' more expensive combination drugs and formulations symbolizes modernisation and the number of Medical Representatives; status. The private sector rural doctor depends on patients for his/her income. And the drug industry provides ways to facilitate this aspiration through samples, incentives, detailing and providing information about new introductions into the market.

Earlier studies (Medawar Charles, 1981, Silverman et al, 1982, Majumdar J.S. 1986) have highlighted the lack of information and sometimes supply of misinformation that such agents of the drug industry provide. Our study bring forth the lack of continuing education of doctors. Public sector doctors receive only a bit of CME, about rational therapeutics, the other trainings concern the implementation of national programmes. On their own initiative only 12.6% of private sector practitioners subscribe to medical journals. No public sector doctor took even this much of initiative!

B-6 : Conclusion

We conclude that the following factors influence the prescription-practices of doctors in Satara district :

Lack of proper continuing Medical Education of doctors on rational therapeutics, leaving the doors open to the propaganda of the drug companies to influence the doctors' prescriptions through their printed literature and Medical Representatives.

Increasing competition and commercialization amongst doctors which induces the doctors to resort to irrational practices to please the patient depending upon the patient's economic and social status.

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Section - C

KNOWLEDGE OF PHC NURSES ABOUT COMMON MEDICINES

C-1 : Introduction

Nurses in PHCs and their sub-centres are a sizeable group using medicines. Nurses stationed in PHCs use medicines by and large, under the supervision of the Medical Officer in the PHC; whereas nurses in sub-centres have to use them generally without any direct supervision of doctors since Medical Officers do not reside at the sub-centres. (They visit sub-centres only on specified days.)

There is no direct way of analysing the level of rationality of use of drugs by nurses, because unlike doctors, they neither write down diagnosis nor a prescription on the case-paper. Only a register of drug-consumption is maintained, which is not useful for analysing the 'drug-use-practices' of nurses. It was therefore, decided to record and analyse the knowledge - status of these nurses about common drugs they use. This would indirectly give an idea about the level of rationality of drug- use by these nurses and indicate the areas in need of improvement. We are unware of any such study in India of drug-use by nurses.

C-2 : Materials and Methods

The list of medicines included in the sub-centre kit contains eleven medicines. (Annexure - C-I) Out of these, five tablets - aspirin, paracetamol, antacid, mebendazole and furazolidone were selected for assessing the knowledge of the nurses. These five medicines are the most commonly used and need specific instructions to patients about their use and possible side - effects. The other five are either not commonly used or do not have very specific indications or precautions. Hence they were not selected. Four other medicines - Iron tablets, Oral Rehydration Powder, Mala-D (the combined contraceptive pill), and tablet methergin supplied through the Maternal and Child Health Programme are very commonly used by nurses ; and need specific guidance to patients. Hence they were selected for evaluation. Copper-T was also included on the same grounds, though it is not a medicine. [It is however, included in the WHO essential drug list]. Thus a total of ten "medicines" commonly used by nurses in PHCs and which have some specific indications and precautions, were selected.

INRUD (International Network for Rational Use of Drugs) has recommended that at least 20 health - centres be selected for a drug - utilization study (WHO 1993). We selected 24 health centres

Table No. C - 1

Questions and Standard Answers about Common Drugs Used by Nurses in Public Health Facilities

(Translated from original Marathi version)

Sr. No (1)	Name of the Medicine (2)	What are the indications for its use? (3)	What is the adult dose? (4)	Warningsside-effects and precautions (5)
1	Antacid Tab (Total 15 marks)	Burning sensation or acidity in stomach (Five marks)	2 tabs.4-6 times a day (Five marks)	For temporary relief only. For repeated problem, refer to the doctor. (Five marks)
2	Aspirin Tab (Total Thirty Five	i) All body aches except stomach pains ii) Fever (Ten marks)	1 to 2 tablets 2 to 3 times a day (Five marks)	i) Not on empty stomach. Take a glassful of water with the tablet. ii) Not to be given below 12 years of age in fever. iii) Not to be given in case of acidity or ulcer iv) Not to be given if the patient reports any problematic experience of this drug. (Twenty marks)

Table No. C-2

Marks Scored by 24 nurses in Primary Health Centres in Questions About Common Drugs

1	2	3			4	5	6
Sr No	Name of the drug (assigned marks)	Marks obtained in question about			Total marks assigned	Total marks scored	Total Scored marks as % of Total Assigned marks
		Indi-cation	Dose	Preca-utions			
1	Tab Antacid (15 marks)	118 (120)	58 (120)	12 (120)	15 x 24 = 360	188	52.2%
2	Tab Aspirin (35 marks)	164 (240)	98 (120)	155 (480)	35 x 24 = 840	417	49.6%
3	Copper - T (30 marks)	120 (120)	— (—)	194 (600)	30 x 24 = 720	314	43.6%
4	Tab Furazolidone (30 marks)	72 (360)	97 (120)	56 (240)	30 x 24 = 720	225	31.3%
5	Tab Iron Folic acid (30 marks)	205 (240)	114 (120)	142 (360)	30 x 24 = 720	461	64.0%
6	Tab Mala-D (O.C. pill) (35 marks)	120 (120)	113 (120)	202 (600)	35 x 24 = 840	435	51.8%
7	Tab Mebendazole (10 marks)	118 (120)	75 (120)	— (—)	10 x 24 = 240	193	80.4%
8	Tab Methergin (15 marks)	45 (120)	73 (120)	30 (120)	15 x 24 = 360	148	41.1%
9	ORS Powder (15 marks)	116 (120)	79 (120)	30 (120)	15 x 24 = 360	225	62.5%
10	Tab Paracetamol (25 marks)	149 (240)	105 (120)	13 (240)	25 x 24 = 600	267	44.5%
	All 10 medicines	1227 (1800)	812 (1080)	834 (2880)	5760	2873	49.9%
	Average per medicine (%)	68.17%	75.19	28.96%	49.88		

(Figures in the bracket indicate total assigned marks for that question/ subquestion..)

- nine PHCs along with one or two sub-centres attached to each of these PHCs. These nine PHCs were selected randomly from the 18 PHCs visited for data collection during winter 1993. Their distribution was as follows :

backward zone - 11 health centres
average zone - 8 health centres
developed zone - 5 health centres

Knowledge of these 24 nurses about these ten medicines was assessed by administering a questionnaire in tabular form. Standard answers were prepared for these questions. (After the interview, a complimentary copy of the standard answers in the regional language was given to the interviewed nurse. See Annexure C-II for the Marathi version). The tabuleted questionnaire and the standard answers are given in Annexure C-III; part of which has been given in **Table no. C-1**, by way of example. The answers given by nurses were evaluated by giving marks to different sub-components of these answers. The maximum marks obtainable for different components of the answers have been given in the bracket in this table. In general, five marks were assigned for each main point in the ideal answers. Five negative marks were given for mistakes of commission : for example if aspirin's indication is mentioned as colicky pain in abdomen. Since different medicines have varying number of major points in the standard answers, the total possible marks for answers in case of each medicine varied from 15 to 35. Out of these maximum possible marks for each medicine, marks were given to each nurse interviewed. These marks along with percentages of the scores obtained by each of these nurses were compared for each of these ten medicines.

C-3 : Results

The results are given below in table no. C - 2. It will be seen from the table that the overall knowledge of the nurses about common drugs which they use is unsatisfactory. Their overall average score per drug is 287 out of 576 i.e 49.9% . The break-up of this overall score shows that the average score for knowledge about indications and about dose per drug was 68.17% and 75.19% respectively i.e satisfactory. But the average score for knowledge about 'precautions' about drug is quite low i.e 28.96% and this has brought down the overall average.

C-4 : Discussion

Lack of adequate knowledge about side-effects of the drugs they use is an alarming finding. Some of the side-effects of these drugs could be life-threatening, for example, simple aspirin can cause bleeding from stomatch, if used improperly.

It may be recalled from Table-A-4 that the overall average score per prescription for doctors was 47.33%, i.e. slightly less than the overall average score per drug (49.9%) by nurses. The task of the doctor in drug-use is far more complicated than that of the nurse in her drug-use. Hence, apparently, their scores are not comparable. But it may be pointed out that doctors are trained far more in drug-use compared to nurses. Their repective scores reflect their relative proficiency in the tasks they are expected to do and hence are comparable.

It is necessary that the nurses in PHCs be given much more training about advice to be given to patients and precautions to be taken while using the medicines which nurses use without direct supervision by doctors.

C-5 : Conclusion

The knowledge of 24 PHC nurses about the common drugs they use was found to be unsatisfactory on the whole. It was satisfactory as regards indications and dosage, but was quite unsatisfactory about precautions to be given to avoid side-effects. However, the overall performance of the nurses as regards their limited role in use of drugs was found to be better than the overall performance of doctors in relation to the tasks expected of them. A much more intensive training and retraining of such nurses needs to be done especially as regards side-effects of the drugs they use.

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Section - D

ILLEGAL SALE OF DRUGS OVER THE COUNTER

A Case Study

D-1 : Introduction

It is well known that in India, patients can buy almost any drug over the counter from the drug-store, without a doctor's prescription. This phenomenon has been reported (Krishnaswamy, 1985; Greenhalgh, 1987) even in the otherwise scanty literature on drug-use in India. We therefore decided to study the range and the proportion of this illegal sale of over the counter drugs (OTC) in Satara district in order to get a concrete idea about this phenomenon in a typical area in Maharashtra State.

D-2 : Materials and Methods

Different drug-stores in Satara district were approached with a request to cooperate in recording the OTC-sale without doctor's prescription, But none was willing to co-operate in recording of this illegal activity despite our assurance of anonymity of source of information. Finally an employee of a drug-store in Satara agreed to give us a record of the names and quantities of Schedule H drugs sold OTC in a day in winter 1993. This was done when the owner of the shop had been out of station. The employee also gave us the total sales figure in that drug-store in a day.

D-3 : Results

The record given to us of sales of drugs in a drug store in a day, as well as the cost of these drugs as per retail prices quoted in the 1992-93 edition of the Indian Pharmaceutical Guide (IPG) is given below in table no. D-1.

It will be seen from Table D-1, that almost any scheduled drug could be bought in this drug-store in Satara without a doctor's prescription. Such OTC sale as a portion of the total drug-sale in a day in that drug-store, was 11.23%.

D-4 : Discussion

In the study by K.Krishnaswamy et al, referred to earlier, 33 out of 330 drug-stores in the twin city of Hyderabad- Secunderabad, were selected. Given our experience in Satara, it is surprising that the researchers were allowed by the drug-stores to record the illegal sale of drugs over the counter. We approached a dozen medical stores with a request to allow copying down of all their drug-sales for one day. But only one agreed to cooperate, that too in the absence of the owner of the drug-store!

Secondly, the proportion of drugs bought over the counter, without doctor's prescription was found to be 47% in the Krishnaswamy study as compared to 11.23 in the current study. We are unable to explain entirely, this big difference. The Krishnaswamy study was done a decade ago in the twin-city in 33 drug-stores in a relatively backward state. Ours was conducted in a single drug-store in a small town in a relatively progressive state. We do not know whether these differences can adequately explain the differences in the results of these two studies. Another study in Maharashtra which can elicit better co-operation from drug-stores and hence has a larger sample, can throw more light on this issue.

We are not against sale of OTC drugs as such. Some drugs like paracetamol, mebendazole, iron, calcium, antacid, local balms, etc., are quite safe and useful. They should be available OTC along with detailed guidelines about use, dosage, precautions, contraindications. But sale of schedule - H drugs without doctor's prescription, must stop. Patients purchase such drugs at the drug-store, OTC to save time and money spent at the doctors' clinics. Unless medical care is made cheaper by eliminating use of irrational, unnecessary drugs and injections, and drug-regulations are strictly enforced, the menace of illegal OTC sales and the consequent inappropriate use of drugs would continue - a practice which is ultimately harmful to the patients. There have been instances where patients have continued consumption of steroids for months through OTC purchase without doctor's prescription. The resultant serious side-effects can ruin a patient's life. It is high time that such illegal OTC sale of drugs be stopped forthwith.

D-5 : Conclusion

In this study of illegal OTC sale of drugs in a day in one drug store in Satara-town, it was observed that any type of drug could be bought in this drug-store without doctor's prescription and that such OTC sale was 11.23% of total sale during that day.

Such illegal and highly dangerous practice must be stopped.

Table - D-1

Illegal Sale of Drugs
Over the Counter in a Day in a Drug Store in Satara

Sr. No.	Name of the drug	No. of Tabs/ Units	Cost per Unit	Total Cost
1.	Abdec Drops	2	5.78	11.76
	Livoline Drops	1	6.00	20.50
	Sy.. Bonnisan	1	15.00	15.00
2.	Tab Enteroquinol	6 tabs	0.17	1.02
3.	Tab. Surbex T	10 tabs	0.56	5.60
	Inj. Mixtard	1 vial	77.32 (10 ml vial)	77.32
	Tab. Diabense 250 mg.	10 tabs	0.42	4.20
4.	Tab. Unienzyme	10 tabs.	0.27	2.70
5.	Tab. Perinorm	4 tabs x 1bd	0.41	3.28
	Tab. Enteroquinol	6 tabs	0.17	1.02
6	Tab. Zolax 0.5 mg.	10 tabs	0.39	3.90
7.	Tab Trental 400 mg.	6	5.98	35.88
	Tab. Disprin C. V. 100	10	0.21	2.10
	Tab Anxipar 10 mg.	6	0.27	1.62
8..	Tab Sinus 77	6	0.67	4.02
	Cap Moxydill	6	2..62	15.72
9.	Cap. Becosule	4 x 10 D	0.56	2.24
10.	Tab, Dulcolax	2HS	0.50	1.00
11	Arnopen Linimint	1	25.00	25.00
	Tab Brufen	6 tabs	0.37	2.22
12.	Sy. Crocin	1	8.22	8.22
13.	Electral Powder	1	9.95	9.95
14	Tab. Nuril 10	10	2.23	22.30
	Tab. Nucardia retard	10	0..86	8.60
	Tab. Calpovit F	10	0.71	7.10
15.	Candid Mouth Paint	1	13.80	13.80
	Cap. Becosule	10	0.56	5.60
16	Tab. Hostacyclin 500 mg.	5	1.51	7.55
	Tab. Betnesol 0.5 mg.	5	0.44	2.20
	Tab. Zintac 150 mg.	5	1.88	9.40
	Tab. Imol	5	0.30	1.50
17.	Visyneral drops	1	----	7.49
	Sy. Ostocalcium	1	----	16.90
	Evion drops	1	10.58	10.58
	Tab. Lactason	30 tabs	13.05	130.50
			Total OTC Sale	497.99
			Total sale on that day	4436.00
			OTC sale as % of Total Sales	11.23 %

Section - E

FINANCIAL WASTAGE DUE TO IRRATIONAL PRESCRIPTIONS

E-1 : Introduction

In Section-A of this study, we confirmed the impressions of many critical observers that a substantial proportion of doctors' prescriptions contained irrational and/or unnecessary drugs. Both unnecessary and irrational drugs increase the cost of drug treatment. This is because, most irrational drugs contain one or two useful drugs and in addition, one or more unnecessary or useless or inappropriate drug. This leads to financial wastage. Estimation of such wastage is obviously needed in a poor-country like India where there is a far greater need to use resources frugally. We are unaware of any systematic published Indian study which calculates the financial wastage due to irrational prescriptions. We therefore, decided to estimate the same. Since irrational prescriptions are found in public sector also, (though to a lesser extent) prescriptions from public sector were also studied from this angle.

E-2 : Materials and methods

E-2.1 : Sampling

Out of the sample of around 30 prescriptions collected in summer-1993, from each of the 40 clinics under study in Satara district, a 20% sub-sample was selected through systematic random sampling. Out of the prescriptions collected during summer 1993, 81 (18%) out of 439 prescriptions from private practitioners and 108 (17%) out of 627 prescriptions from public health facilities were selected for this study.

E-2.2 : Cost-calculations

Per day cost of drug treatment as per these prescriptions by doctors, minus the per day cost as per Standard Drug Treatment Regimens (SDTRs) would give the financial loss to the patients due to irrational prescriptions per day of drug treatment. The format for doing this exercise has been given in the format below:

Cost calculations for so many conditions encountered in these prescriptions is a tedious job. We therefore used the cost-calculations already done for the Standard Drug Treatment Regimens (SDTRs) at 1991 prices (Annexure A-I).

Since the costs of the prescriptions were to be calculated as per retail - prices, we used "private - rate" (as given in Annexure-A-I) i.e. retail-prices and not the rate contract prices for the cost-calculations of SDTRs. Many of the prescriptions collected were for two to three days' duration, whereas the SDTRs were for adequate duration, i.e. from three to five days to 270 days ! For a fair cost comparison between the two, cost of drug-treatment per day was worked out in case of both SDTRs and for doctors' prescriptions.

Some of the brands in doctors' prescriptions were not listed in CIMS. In such cases, alternative, cheaper brand listed in CIMS containing the same or equivalent medicine was chosen. Some of the diseases encountered in the prescriptions were not included in the limited list of SDTRs for 92 common conditions. In such cases SDTRs were prepared for these rarer conditions and their costs were estimated as per prices in the January - April 1991 issue of CIMS mentioned above.

In many prescriptions (13 out of 81 in the private sector and 24 out of 108 in the public sector) the drugs recommended were quantitatively and/or qualitatively deficient compared to the SDTRs. In such cases, the cost of treatment as per the doctor's prescriptions was less compared to that due to SDTRs. Such cases were excluded from analysis.

Format For Calculating Financial Wastage Due to Irrational Prescriptions

Sr. No	Health Centre and degree of the doctor	Disease/ condition	Patient's Age	Prescription		No. of doses per day
				Drug	Dose	
a	b	c	d	e	f	g

Cost per dose	Cost per day	Cost of prescription as a whole	Cost per day as per SDTR	Wastage per day	Wastage as % of money spent
					l x 100/i
h	i	j	k	l	m

E-2.3 : Estimate of Wastage at District Level

The financial wastage, as found in this study, was projected at District level with the help of available estimates of morbidity load in the community, and of the District population.

E-3 : Results

E-3.1 : Wastage per Prescription

It will be seen from the table no. E-1 that due to irrational prescriptions, a whopping 63.6% of money spent on drugs is a waste! The proportion is much higher in case of private sector (69.2%) as compared to that in the public sector (55.4%). In absolute terms, this wastage is Rs.4.76 and Rs.2.08 per prescription per day in private and public sector, respectively, with an average of Rs.3.28.

E-3.2 : Wastage At District Level

The financial wastage due to irrational prescriptions as found in this study has been projected at Satara district level in table no. E-2.

E-4 : Discussion

The 'INRUD Drug Use Bibliography' (INRUD 1992) contains 2286 references on drug-use studies. But there are no studies which calculate financial wastage due to irrational prescriptions. Ours is the first study to do this exercise.

Our sample of prescriptions was from summer-93, but our cost-calculations are based on 1991 prices. This is because we used the ready-made cost calculations at 1991-price-levels from Annexure A-I, and thereby avoided the tedious work of calculating prices for 92 common conditions at 1993 retail-prices. This does not however, vitiates our results because we have used 1991-prices for cost-calculations of both the SDTRs, as well as of the doctors' prescriptions.

The financial wastage due to irrational prescriptions, as found in this study is phenomenal in absolute and relative terms. In the public sector, this financial loss, as projected at Satara-district level works out to be more than its drug-supply itself! This is because, we have assumed an average of three days' treatment, whereas in fact, in many PHCs, the patient is sent back with only a day's medicines.

Secondly, our cost-calculations are at retail prices, whereas the drug-supply figures for public sector are at bulk-prices for rate contract. The average wastage is 63.63% of

Table No. E - 1

Monetary Wastage Due to Irrational Prescriptions

Sr. No		Private	Public	Total
1.	No. of Prescriptions	68	84	152
2.	Cost of doctors' prescriptions per day (in Rs.)	467.62	315.67	783.29
3.	Cost as per S.D.T.R per day (in Rs.)	144.09	140.82	284.91
4.	Wastage due to irrational prescriptions per day (in Rs.)	323.53	174.85	498.38
5.	Wastage as % age of money spent by the patient (Sr.No. 4/2100)	69.19	55.39	63.63
6.	Wastage per prescription per day. (Sr. No. 4/1)	4.76	2.08	3.28

total cost of prescriptions in table E-1, whereas it is 70.6% of total drug consumption in Satara district, in table E-2. This is because, the figure 70.6% is based on a weighted average of wastage in public and private sector, based on the OPD attendance data for Satara district in 1991-92, the estimated total morbidity load in Satara district and the estimated drug consumption in Satara district. On the other hand, the average in table E-1 is based on actual expenditure on 68 private and 84 public sector prescriptions.

In table E-2, the figure of 0.99 million cases attending OPDs in Public Health Facilities in Satara district in 1991-92 is the actual number as per records. However, the estimates of total morbidity load in Satara district are not based on morbidity-rate in Satara, but are based on rough All-India estimates. We have used them in absence of any other better source, and because the actual morbidity rate is unlikely to be much different from the All-India morbidity rate. As per this assumption, the proportion of patients going to the public sector (0.99 million) is a mere 7.88% of the total morbidity load of 12.56 million. As per other studies, 17 to 45 percent of patients go to public sector. (Duggal Ravi 1989, Kannan 1991, Alex 1993, Baru Rama 1993). In tune with these studies, if we assume that

Table : E-2

Estimated Financial Wastage During 1991-92 in Satara District due to Irrational Prescriptions

Sr No.		Estimate-I	Estimate II	Average
1.	Estimated Rate of Morbidity load in India	3.25 illness episodes/yr/ capita[2]	2% morbidity - per day[1]	
2.	Annual Morbidity for Satara District[3] (popu-ulation 2.45 m.)	3.25 x 2.45 = 7.96 million cases	2 x 365 x 2.45 100 = 17.89 m. cases	12.56 m.
3.	Out of which a) those going to Public Sector	0.99 m.[4]	0.99 m.	0.99 m.
	b) those going to Pvt. Sector	6.970 m.	16.96 m.	11.96 m.
4.	Wastage in Public Sector (Rs. 2.08/day for 3 days per case)	Rs. 6.20 m.	Rs. 6.20 m.	6.20 m.
5.	Wastage in Private sector (Rs. 4.76/day for 3 days per case)	Rs. 99.52 m.	Rs. 242.15 m.	Rs. 170.83m.
6.	Total Wastage in Satara district	Rs. 105.72 m.	Rs. 248.35 m.	Rs. 177.03m.
7.	Wastage as % of Total Drug supply of Rs. 218 million	48.50%	113.92%	81.25%

[1] Duggal Ravi 1994
[2] Park JE 1987
[3] Since we do not have data for total morbidity in Satara district, we have used the All-India estimate quoted in the first row.
[4] Govt. of Maharashtra, Performance Budget 1993-94

in Satara, 75% of patients go private sector and not 92% as assumed in table E-2, the private sector patients in Satara amount to 0.99 x 4 = 3.96 m. The wastage in private sector becomes 3.96 x 4.76 x 3 = Rs. 56.55 m; the total wastage Rs. 62.75 m. (29.46% of total drug sale in Satara district). These differences in estimates can be resolved only if we get reliable community-based total morbidity data.

E-5 : Conclusion

The financial wastage due to irrational prescriptions as found in this study of a representative sample of 152 OPD prescriptions from Satara district is very high in absolute and relative terms. A poor country like India can not afford such colossal wastage of scarce financial resources.

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Section - F

PROPORTION OF PRIVATE PRESCRIPTIONS IN PUBLIC HEALTH FACILITIES

Patients visiting Public Health Facilities (PHFs) should get all the drugs required for the treatment of their ailments, free of charge from the PHFs. But there is a common complaint, as well as our own observation during this study that doctors in PHFs ask patients to buy some of the medicines by giving them "outside - prescriptions". This is because of chronic shortage of medicines in PHFs. We decided to estimate the amount spent by patients on such "outside - prescriptions" in a sample of prescriptions in our study. To our knowledge, there are no published estimates about such "outside - prescriptions" given in PHFs in India.

Materials and Methods

We decided to draw a 20% sub-sample out of the prescriptions recorded from Public Health Facilities during Winter 1993. The sample frame thus consists of the prescriptions collected from our sample of PHFs in a day during winter 1993. Out of the 561 prescriptions copied down from these PHFs, every fifth prescription was selected with a random start from prescription no.4 in each of these health centres. While copying down prescriptions, drugs prescribed "from outside" and those dispensed from the PHF had been recorded separately as per the basic protocol for copying prescriptions. In case of the 145 prescriptions selected for this study, the drugs prescribed through the "outside - prescriptions" and the "dispensed drugs" were enlisted separately. The cost of both types of drugs (prescribed and dispensed) was calculated as per retail prices as given in the 1992-93 edition of Indian Pharmaceutical Guide (IPG). Though the health department paid for the medicines at rate contract rate, and the patients paid at retail-market rate; to compare the relative proportion of dispensed drugs and "prescribed drugs", costs were calculated at a uniform rate, the retail market rate given in IPG 1992-93 edition.

Generally prescriptions or order for dispensed drug in PHFs are in generic name. In such cases cheapest brand from CIMS or IPG was selected. Some of the "outside prescriptions" contained local brands not listed in CIMS or IPG. In such, cases cheapest brand of equivalent drug-category was selected in lieu of the brand actually prescribed by that doctor.

In many villages where PHCs have been located, there is no drug-store. Therefore MOs in such PHCs tend to give outside-prescriptions quite infrequently. Whereas, the situation is different in PHFs located in small towns and larger towns, where the availability of drug-stores, increases the tendency to write outside prescriptions. We, therefore, studied PHF's located in cities and small towns (as enlisted in the District Census 1981) separately. These places have one or more drug-stores and hence doctors in PHFs in these places tend to write outside-prescription more often. Out of 19 PHF's visited for study in winter 1993, 7 were based in cities or small towns.

Results

It will be seen from table F-1 that the cost of private prescription in Public Health Facilities in case of 145 randomly selected O.P.D. cases in Satara district in a day in winter 1993, was 15.43% of the cost of drugs dispensed from these 19 clinics to these 145 patients. In absolute terms, the cost of these privately prescribed drugs if distributed over all these 145 patients, comes to only Rs. 0.82 per patient (It may be noted that out of these 145 patients, many were not given any private prescription).

The 145 prescriptions selected for this exercise were grouped into batches of 25 prescriptions each, with the last batch containing remaining 20 prescriptions. There was considerable batch to batch variation in the proportion of cost of prescribed drugs to dispensed drugs. But for last 3 batches, the accumulated average has stabilized indicating that the size of our sample of 145 prescriptions was adequate.

Table - F-2 gives cost of privately prescribed drugs as a proportion of cost of dispensed drugs in a day during winter season in 7 Public Health Facilities located in Urban towns and small towns (as defined in the census) in Satara district. It will be seen from the table that even in the bigger and small towns, the cost of privately purchased drugs as a proportion of dispensed drugs on an average is only 15.64%. It ranges a great deal from zero to 221.5%. The average cost of privately purchased drug, per prescription in these 7 PHFs was found to be Rs. 7.97, which is much higher than that found for all centres.

Discussion

It appears from these two tables, that the overall average proportion of privately prescribed drugs in PHFs in Satara district is uniformly low; except in some Public Health Facilities in big and small towns, where it ranges considerably, from zero to a very high of 221.5%. In urban areas, because of availability of drug-stores, the doctor in a PHF does not hesitate to write an "outside-prescription" if a particular drug needed for the patient is not available in the PHF. There is also an increased tendency to write unnecessary drugs as seen in the Umbraj PHC. But, PHFs such as the District Civil Hospital and Cottage hospital are much better supplied compared to PHCs and hence there is much less need to prescribe outside-drugs in these PHFs.

Patients coming to PHFs should get all the drugs needed for their ailments and they should not be required to buy medicines at all. The present average of 15% of drugs required to be bought by patients is not high but certainly undesirable and should be zero.

Table F-1

Cost of " outside-prescriptions" in a Sample of Prescriptions from 19 Public Health Facilities

Sr. No.	Batch No.	Cost of dispensed drugs (in Rs.)	Cost of prescribed drugs (in Rs.)	Cumulative Cost of dispensed drugs	Cumulative Cost of prescribed drugs	Col. 4 as % of Col.3 (%)	Col. 6 as % of Col.5 (%)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	1	130.60	15.24	130.60	15.24	11.67	11.67
2	2	210.09	12.52	340.69	27.76	5.96	8.15
3	3	172.61	27.32	513.30	55.08	15.82	10.73
4	4	76.39	29.12	589.69	84.20	38.12	14.20
5	5	83.21	13.84	672.90	98.04	16.63	14.57
6	6	98.79	21.00	771.69	119.04	21.26	15.43
Total prescr.	145	771.69	119.04			15.43	

(Each batch contained 25 prescriptions each except the last batch, which contained 20 prescriptions)

Table F-2

Cost of " outside-prescriptions" In Public Health Facilitie in a Day in Selected Towns in Satara District

Sr. No.	Name of the Public health facility	No. of cases	Cost of dispensed drugs	Cost of prescribed drugs	5 as % of 4
(1)	(2)	(3)	(4)	(5)	(6)
1.	COTTAGE HOSPITAL KARAD	38	285.91	1.20	0.42%
2.	KOREGAON RURAL HOSPITAL	40	381.25	23.42	6.14%
3.	LONAND PHC	36	87.73	32.40	36.93%
4.	NAGTHANE PHC	32	152.58	------	0.00%
5.	SATARA CIVIL HOSPITAL	40	799.77	-----	0.00%
6.	SHIRVAL PHC	49	250.73	11.75	4.69%
7.	UMBRAJ PHC	25	115.31	255.43	221.52%
	7 Public Health Facilities	260	2073.28	324.20	15.64%

Conclusion

In Satara district, patients have to pay 15% of the cost of the drug-treatment in PHFs. In PHFs in small and large towns, there is considetable variation in this proportion from zero to 222%, ; patients have to pay an average of Rs. 7.97 per prescription in towns as compared to Rs. 0.82 per prescription in the district as a whole. Steps should be taken so that patients do not have to pay for drugs at PHFs.

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NEED VERSUS SUPPLY OF DRUGS

G-1 : Introduction

It is often pointed out that the per capita drug consumption in a developing country like India, is quite low as compared to that is the developed contry. The drug-companies want the drug-consumption in India to increase from the current estimated consumption of about Rs.7000 crores to Rs.15000 crores by the year 2000 AD. But this estimate is not based on any study of the actual needs of the Indian people, based on the prevalence rates of all the diseases in India. We therefore decided to make such a need based estimate of drug-requirement for Satara district as an illustrative example. We are unaware of any study which has estimated the drug needs at district level or above in a systematic manner on the basis of estimated morbidity load.

G-2 : Materials and Methods

We carried out this exercise in two stages. We first estimated the drug needs for curative/ symptomatic care if the patients coming to PHC - OPD were to be treated rationally and adequately. This need was compared with the average drug supply to PHCs for curative/symptomatic care during 1991-92 in Satara district.

In the second stage of our exercise, we estimated the drug needs for Satara district, if all the patients in Satara district were to be adequately and rationally treated and if all children and mothers in Satara district were to be given adequate preventive medication in a Maternal and Child Health (MCH) programme. This need was compared with the total sale of drugs of Rs.21.28 crores during 1991-92 in Satara district.

The first step in this exercise was to calculate the number of ill persons who come to PHC - OPD for medical relief. This was done as follows -

G-2.1 : Morbidity Load at PHC-OPD

In the first phase of the study, drug-supply data of nine PHCs were collected. Out of these nine PHCs, we wanted to select 6 PHCs for this study ; 2 each from average, backward, developed area. But only 2 out of these 9 PHCs were in the averagely developed area and one of them the Bawdhan - PHC had a very low OPD attendance. One PHC from backward area was selected to replace the Bawdhan PHC. The Pimpode PHC from developed area was also excluded due to low OPD turn-out and the Aundh - PHC from backward area was dropped because of very poor records in that PHC.

The final selection was as follows -
PHCs from backward area - Khatav, Mayani, Vaduz
PHCs from average area - Bhuinj
PHCs from developed area - Indoli, Undale

The average annual OPD attendance in these PHCs in Satara district is 7774. To get a minimum average sample of more than 100 cases, an approximate 5% sample was taken, i.e. every 20th case-paper from the case-papers of 1991-92 was selected, starting from a random number. The condition for which treatment was sought during the last visit as noted on the case-paper, along with the age of the patient, was noted down by the pharmacist-investigator. The format for collecting these data has been given in appendix G-VII. Tabulation of these data and multiplying the frequency of each of the diseases noted in this manner by a factor of twenty gave us the estimated disease-wise frequency of patients coming to PHC-OPD. Since overall aim of this exercise was to estimate drug-needs of this morbidity load, the patients were grouped into 3 age-groups - 0-5 years, 6 to 12 years and above 12 years. This grouping corresponds to the broad age-groups in the Standard Drug Treatment Regimens (See Annexure-A-I).

G-2.1.1 : Cost of Drug-Treatment at PHC OPD

In order to calculate the cost of an adequate and rational drug treatment for all the cases coming to PHC - OPD, the cost of drug treatment for the 92 common conditions commonly encountered at PHC - OPD, were worked out. As mentioned earlier, Annexure A-I gives the SDTRs as well as their cost at rate contract prices.

The cost of treatment per case multiplied by the number of cases coming to the PHC OPD during 1991-92 gives the total drug need in money-terms for that particular illness. This need was estimated for all the diseases encountered in the sample of case-papers drawn as mentioned above, for each of the six PHCs. This estimate excludes cost of drug-therapy for TB and Leprosy because the PHC-OPD routine case paper records do not contain a record of TB and Leprosy patients. These records are kepy separately.

G-2.2 : Total Morbidity in Satara District

To estimate the drug-needs of a community we would require community based morbidity data. In India, community-based morbidity data for some diseases have been recorded. But to our knowledge, comprehensive morbidity data for all major and common diseases in India are not available. However, some estimates of overall marbility load in India are available. (Park J.E. 1987, Duggal 1994). We used these estimates for Satara district since these data for Satara district are not available.

To calculate the total no.of children and pregnant women in need of preventive medication, we needed age-wise break-up of the Satara district population. But this break-up is not available. We therefore used the figures for Maharashtra state. For this purpose, instead of the census data, we used the more reliable data and estimate of a study by researchers at the Gokhale Institute of Politics and Economics, Pune (Balsubramanyam K et al, 1994). We are thankful to Ms.Sanjeevani Mulay for drawing our attention to their study.

G-2.3 - Cost of Total Drug Needs of Satara District

Based on data of a sample of 6 PHCs in Satara district, the average cost per patient at 1991-92 rate contract prices, as worked out in table G-1, was Rs. 11.68. We multiplied this figure by the estimated total morbidity load in Satara district to get the total drug needs for **curative/symptomatic care (excluding TB and Leprosy)**.

In calculating the cost of adequate and rational treatment for all the cases coming to PHC-OPD, we had deleted the **cost of drug-therapy for TB and leprosy,** since the data for the same were not available in the PHC OPD routine case papers records. But in estimating the total drug needs for Satara district for OPD level curative/symptomatic care, we have to add the cost of drug-therapy for these,two diseases for all patients in Satara district. To estimate this cost, we need prevalence rate of TB and Leprosy in Satara district. No such data are available. We therefore used the prevalence rate of 2%, for TB, as found in various surveys in India (Park J.E. 1990, page 132) and a prevalence rate of 6.37 cases of leprosy per thousand population in Maharashtra state. The age-wise break-up of the Satara population (0-5 years, 5-12 yrs, above 12 years) is required to calculate cost per case for these age-groups. But such break-up for Satara district is not available. We therefore used the data for India, since such demographic data do not vary much within India.

For cost calculations, we used the cost of treating these diseases, as worked out in Annexure - A - I.

To get the cost of **preventive medication** for all children and pregnant women, we first worked out the cost of immunization per child for primary and secondary immunization and the cost of drugs

Table No. G-1

Morbidity load at the PHC OPD and the standard cost of treatment for the same at Rate Contract Prices (1991-1992) for 6 PHCs (Excluding Leprocy and Tuberculosis)

Name of PHC	Adult (above 12yrs.)			Child (6-12 yr.)			Child (0-5yr.)			Total		
	No. of cases	Total cost (Rs.)	Cost per case (Rs.)	No. of cases	Total Cost (Rs.)	Cost per Case (Rs.)	No. of Cases	Total Cost (Rs.)	Cost per Case (Rs.)	No. of cases	Total Cost (Rs.)	Cost Case (Rs.)
Bhuinj	5420	89125	16.44	1040	5712	5.49	1000	1635	1.64	7460	96472	12.93
Indoli	3460	29390	8.49	920	2192	2.38	580	533	0.92	4960	32115	6.47
Khatav	4680	87544	18.71	880	4839	5.50	420	633	1.51	5980	93016	15.55
Mayani	3680	66611	18.10	1120	6602	5.89	840	2582	3.07	5640	75795	13.44
Undale	2780	28981	10.42	300	1924	6.41	260	836	3.22	3340	31741	9.50
Vaduz	5140	54948	10.69	1020	10505	9.72	1040	9917	10.28	7260	75370	10.38
Total	25160	356599	14.17	5280	31774	6.02	4140	16136	3.90	34640	404509	11.68
Average	4193	59433	14.17	880	5295.6	6.02	690	2689.3	3.90	5773.	67418.16	11.68

for Ante Natal care per pregnant woman. This cost, multiplied by the total number of children and pregnant women in need of preventive medication gave us the cost of comprehensive preventive medication for the Maternal and Child Health Programme.

G-3 : Results

G-3.1 : Curative Drug Needs at OPD Level

The detailed Standard Drug Treatment cost-estimates for each type of the diseases reported at each of the six PHCs selected for study, are given in Annexure nos. G-I to G-VI. Given below in table no. G-1 is the summary of these results.

for treatment of Tuberculosis and Leprosy. But this small deficiency would not materially affect the argument given in section G4.1.

We have also worked out as an illustrative example, the requirement of different important, commonly used drugs for Bhuinj PHC and have compared this with the actual supply to Bhuinj PHC during 1991-92. The category-wise (as per categories of Essential Drug List of WHO) requirement and supply for Bhuinj PHC has been given in tabular form in Annexure G-VIII. This table illustrates in a very concrete way the category wise shortfalls and imbalances in the supply of drugs to a PHC.

Table G-2
Annual Drug Requirement of Satara District
For Curative/Symptomatic Care At PHC-OPD Level, for 1991-92

	Estimated rate of morbidity load ***	Annual morbidity for Satara district (Popn.2.45m)	Drug requirement per case (as per table G-1) in Rs.	Total drug requirement for Satara district in Rs. million
Estimate - I*	3.25 illness episodes/ capita/year	3.25 x 2.45 = 7.96 million	11.68	92.97
Estimate - II**	2% morbidity per day	$\frac{2 \times 365 \times 2.45}{100}$ = 17.89 million	11.68	208.96
Average		12.93 million	11.68	151.02

* Based on Park JE (10th edition). We have taken the average of the range given by Park of 2.6 to 3.9 illness episodes per capita per year.
** Duggal Ravi (1994)
*** Since the estimate of rate of morbidity load for Satara district is not available, we have used the available estimated rate of morbidity for India.

It will be seen from Table G-1 that the average drug requirement for curative/ symptomatic care for patients seeking treatment at PHC-OPD during 1991-92 was Rs. 67418 per PHC for these six PHCs; Rs.11.68 per patient. As mentioned earlier, we have not included here, the drug-cost

G-3.3 : Total Curative Drug Needs of Satara District

The need of Rs.67418 per PHC per year as calculated in Sec G-3.1 is only a small part of the total drug needs of all the people in Satara district.

This is because only small proportion of patients go to PHC. The rest go to private practitioners. The drug need for curative/symptomatic care of the total population, has been worked out in table G-2. It would be seen from this table that this drug-requirement for **OPD level curative/symptomatic care** (excluding TB and Leprosy) for the total population in Satara District is from Rs.93.5 to Rs.210 million with an average of Rs.151.02 million. To this is to be added the cost of treating all cases of TB and Leprosy.

It will be seen from table G-3 that if all cases of **Tuberculosis and Leprosy** in Satara district were to be adequately and rationally treated, in 1991-92, it would cost Rs.27.31 million and Rs.2.42 million respectively, i.e. a total of Rs.29.73 million.

Thus the total drug-cost of treating all OPD level cases (including TB and Leprosy) in Satara district, in a rational and adequate manner, in 1991-92 would be Rs.151.02 m + 29.73 = Rs. 180.75 m.

To this is to be added the drug-cost of indoor cases. As per the performance budget of Govt. of Maharashtra for 1993-94, the drug-cost of indoor cases in Civil Hospital and in the Karad Cottage Hospital was RS. 1.37 million and Rs. 0.25 m. respectively, i.e. a total of Rs. 1.62 m. These two hospitals account for most of the indoor cases in the public sector. The no. of indoor cases in the private sector are not ten times those in the public sector as in the case of outdoor cases. But let us assume that the number of indoor cases in private sector are ten times those in the public sector and

Table No G-3

Estimated Cost of Treatment of All TB And Leprosy Cases in Satara District 1991-92

Sr. No.	Age-group (% of population in that age group)	No. of people in that age-group in Satara District (million)	No. of TB patients in that age-group (thousands)	Cost per case (Rs.)	Total cost (Rs. million)	No. of leprosy patients in that age-group	Cost per case	Total cost (Rs. million)
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)
1.	0-5 years (15%)	0.368	7.35	235.2	1.73	2344	60.58	0.142
2.	5-12 years (22%)	0.539	10.80	352.8	3.80	3433	90.88	0.312
3.	Above 12 years (63%)	1.544	30.90	705.6	21.78	9835	181.75	1.788
4.	Total (100%)	2.451	49.05	-----	27.31	15612	-----	2.42

Footnotes :

A : Estimated from Park J.E. 1990; page 266, table 6. Since demographic data required for this table are not available for Satara district, we have used available rates for Maharashtra /India, for this table.

B : Satara district population in 1991-2.45 million.

C : Estimated prevalence rate of 2% (Park J.E. 1990, page 132, table no.2)

D & G : As per our costing in Annexure A-I. Please see item nos. 56 and 82 respectively in Annexure A-I.

F : Estimated prevalence rate of 6.37 per thousand population. (Park J.E. 1990, page 211, table 1.)

Table No.G-4

Cost of Primary Immunization Per Child (1992 prices)

Sr.No.	Type of Vaccine	Cost per dose	No. of doses	Cost (Rs.)
1.	BCG	Not available	1	---
2.	Oral Polio Vaccine	1.88	5	9.40
3.	DPT(Triple) Vaccine	1.07	3	3.21
4.	Measles Vaccine	4.43	1	4.43
5.	Total			17.04

Note : Except for the measles vaccine, the costs of vaccines have been taken from the 1992 price-list of the Haffkine Bio-Pharmaceutical Corpon. Ltd. (Bombay), the Public Sector Undertaking, which supplies vaccines to the Maharashtra Govt. Measles vaccine is not supplied by Haffkine and hence for measles vaccine, price as given in IPG 1991-92 has been used. Prices for biggest available vial have been used as they are used in mass-vaccination. Price of BCG vaccine is not available since it is supplied by the Central Government.

hence the expenses for private indoor cases would be Rs. 16.2 m; and the total for both the sectors together would be Rs. 17.82 million. To this is to be added the cost of preventive medication.

G-3.4 : Cost of Preventive Medication

The preventive medication is mostly immunization of children and iron-calcium supplementation to pregnant women. The cost of this preventive medication has been estimated for Satara district in table nos. G-4 and G-5. In this calculation, we have assumed that all children would be covered by immunization, whereas only 85% coverage is adequate for herd-immunity. But on the other hand, we have not made any allowance for wastages. The extra 15% vaccine that we have taken, would take care of the wastages during transport and administration etc. It will be seen from the table G-5 that the cost of this comprehensive preventive medication for Maternal and Child Health (MCH) programme in Satara district is only Rs.6.86 million.

G-3.5: Total Drug Needs of Satara District

The total drug-needs of Satara district in 1991-92 would be as follows :

i) For curative care at OPD level excluding TB and Leprosy	Rs. 151.02m.
ii) For all cases of TB and Leprosy	Rs. 29.73 m.
iii) For preventive medication in MCH programme	Rs. 6.86 m.
iv) For indoor cases	Rs. 17.82 m.
Total	**Rs. 205.43 m.**

G-4 : DISCUSSION

G-4.1 : How Much is the Shortfall at PHC ?

Let us compare the need of Rs.67418 per PHC, for drugs for curative symptomatic care, with the drug-supply to these six PHCs for curative, symptomatic care, as worked out in Part I of this study, for the year 1991-92. It was an average of Rs.37134.38 per PHC (for details see appendix II of Part I). We have excluded the supply of anti-tubercular drugs for these 6 PHCs, since the estimate of the need excluded anti-tubercular drugs. These supply- data are based on drug-supply to PHCs from all sources. (As discussed in Part I of this study, PHCs don't get only Rs.15000 to Rs.20000 as mentioned in the Annual Report (1991-92) of the *Zilla Parishad;* much more drug supply comes under various schemes). Thus there is a shortfall of Rs.30284 per PHC.

This shortfall must be met by additional supply. The average recurring expense, per PHC during 1991-92 as given in the 1991-92 Annual Report of Satara Zilla Parishad was Rs. 0.363 million. The additional drug supply required would be only 8.34% of this expenditure. Today, PHCs do not cater adequately to the felt needs of the people for curative/symptomatic care. If this is done by a mere 8.34% increase in the PHC budget for recurring expenses, an important, acutely felt need of especially those poor people in rural area who seek medical care at PHCs, would be fulfilled.

Table G-5

Estimated Cost of Preventive Medication in Satara District 1991-92.

Sr. No.	Type of preventive medication	Population in this categary in Satara district		Cost per person in Rs.	Total cost in million Rs.
		as % of population of Satara district.	absolute nos in millions in Satara district (Pop.2.45 million)		
1.	Primary immunization for all children upto 1 year	2.4%	.0588	17.04*	1.00
2.	One booster dose each, of polio, triple and measles vaccine for all children between 1 to 2 years.	2.4%	.0588	7.38	0.43
3.	One booster dose each of polio and DT vaccine for all children between 5-6 years of age	2.5%	.0613	2.76	0.17
4.	Two doses of typhoid vaccine for all children of 2-3 years of age	2.4%	.0588	1.24	0.07
5.	Iron, Calcium supplementation and tetanus immunization for all pregnant women	3.0%	.0735	70.58**	5.19
6.	Total		.2663		6.86

Note : * As per table no.G-4

** As per the cost of Standard Drugs Treatment Regimen, worked out for this study, in Annexure A-I. See item no.8 (ANC) in Annexure A-I. The prices for this medication are as per prices of Haffkine BPC/ unlike the rate contract prices taken for Annexure A - I.

Secondly, it would increase the esteem of the Public Health System and thereby increase people's co-operation in Public Health Programmes.

Increased drug-supply to PHCs would need a change in the overall official attitude and policy to health care. It is true that prevention is better than cure. But it does not mean neglect of ailments which are already there. The official policy conveniently makes precisely this mistake of neglect of curative/ symptomatic needs of the people, leaving it to the private sector. This attitude must change. A government which collects huge taxes and does not spend even a minimum 5% of GNP (as per recommendations of the Health For All Strategy of the Alma Ata Conference), has no moral right to ask people to go to private practitioners for their curative/symptomatic needs. At least Primary Health care needs must be necessarily met.

G-4.2 Total Drug Needs Versus Supply

Now as reported in Part I of our study the total drug sale in 1992-93, in Satara district, from very much reliable sources (audited accounts of drug-distributors) was Rs.26.6 crores. We estimate that the drug sale in 1991-92 would be 20% less, i.e. would be Rs.21.28 crores. The drug supply of Rs. 5.6 million to the public sector, thus yielding a total drug-supply of Rs. 21.84 crores. Compared to this amount of drug-supply in Satara district, the total drug-requirement as seen in section G-3.5 and G-5 for OPD level curative, symptomatic care, and preventive care as well as for indoor care in 1991-92 was Rs.20.61 crores. It may be pointed out that while estimating drug-needs for various diseases, we have assumed that drugs are given in sufficient amount for adequate duration. Thus the drug expenditure in Satara district in 1991-92 was adequate to take care of all the drug needs of the total population of Satara District.

For estimating the total drug-needs of Satara district, we have used estiamates of rate of morbidity for the Indian population, since these data are not available for Satara district. Despite this deficiency, our estimate would not be off the mark since morbidity rates do not vary a great deal in an average area from the all India average.

G-4.3 : Comparison With The Munnar Project

Based on limited data for a year of 6 PHCs in Satara district, we cannot make general conclusions. But the estimate from the current study in Satara district of the total drug needs may be compared with the actual experience of the Munnar Project. This project caters to all the OPD level and indoor level curative and preventive medical needs of a well demarcated population of 1,00,000 in tea-estates in Kerala. It has been reported that the annual per capita recurring health expenditure in this project was Rs.120/- out of which 25% i.e. Rs.30 was spent on drugs (Cherian T.K.1993). In our study, the total drug need for Satara district for 1991-92 was Rs.206 million, for a population of 2.45 million, i.e. Rs.84 per capita. Thus we have not under-estimated the drug need for Satara district.

G-4.4 : Drug needs for India

This drug need of Rs.84 per capita, if projected to the Indian population of 84.6 crores in 1991, works out to be Rs.7106 crores. If we compare this need with the estimated production of drug formulations in India of Rs.7500crores in 1993-94 (Banerjee Naresh 1995), we find that the present level of drug-production in India would roughly meet all the drug needs of the Indian people for rational and adequate medication. In any case, the argument of the drug industry to increase the present drug production to Rs.15000 crores by 2000 A.D. is clearly untenable.

G-5 : Conclusion

The overall conclusions are :

i. The rational drug-requirement at PHC-OPD level for curative/symptomatic care can be met in Satara district by increasing the health-budget for recurring expenses by about 8.34% and stopping the wastage of money through irrational prescriptions.

ii The total drug needs of Satara district inclusive of rational treatment of all outdoor and indoor level patients and inclusive of total coverage in MCH programme, would be Rs. 20.61 crores in 1991-92.

If the money presently being spent on drugs in Satara district is not wasted on irrational and unnecessary drugs and irrational use of rational drugs, and instead, if it is spent on rational drug-treatment, the current drug-expenditure of Rs.21.28 crores is thus more than adequate to take care of all OPD and indoor level of cases, as well as for preventive care. Thus, today, it is not primarily lack of drug-expenditure that is responsible for the unmet drug-needs of people in Satara district, but its irrational use.

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RECOMMENDATIONS

1) There is a dire need for compulsory 'Continuing Medical Education' (CME) of doctors for rational drug use'. The continuation of registration with the Medical Councils should not be a mere matter of paying registration fee once in five years, as the case today. It should be linked to participation in Continuing Education through an independent journal and periodic conferences. Practical, logistical problems, including those of evaluation of Continuing Medical Education can be solved if there is a will to do so.

Drug companies must print authentic, balanced information about drugs they manufacture and circulate it amongst doctors after prior approval by an expert committee of F.D.A. Misleading propaganda and unethical marketing must stop.

2) Use of Allopathic drugs by non-allopaths and vice-versa should be banned immediately in urban areas where qualified allopaths and non-allopaths are easily available to give service to patients in their own respective pathies. Short courses be started by medical colleges and recognised institutions to train doctors from other systems of medicine to use a limited number of drugs in limited, specified illnesses, safely and effectively from the pathy in which the college/institution belongs. A doctor who has not undergone such a course should not be allowed to do "cross-practice". A time limit of, say, two years be kept for starting such courses. After this time-limit of two years, Medical Practitioners in rural or urban area should be allowed to do cross-practice only if they have undergone such a course and only to the extent of the limits set up by the curriculum of such courses. Use of drugs by untrained people is playing with the lives of the helpless patients. This must be stopped.

3) Periodic prescription analysis be carried out, both in the private sector and in the public health centres, by independent experts. The methodology developed in this study for prescription-analysis may be used for the same purpose. The prescribing doctors themselves may be asked to do prescription- analysis of prescriptions from other *Taluka* so that they would understand the importance of prescription-analysis. Follow up corrective action at least in public sector should be done on the basis of results of prescription analysis. More emphasis should be given on CME about treatment of common diseases.

4) Measures (including incentives and disincentives) should be taken to decongest small and large towns of doctors. This will reduce commercial competition amongst doctors and hence irrational drug use. All private medical colleges (who charge very high fee for affording students) must be banned. Graduates from such colleges are bound to indulge in aggressive commercial competitive practice.

5) All irrational drug combinations must be banned. This will drastically reduce irrationalities in prescriptions. It will also reduce drug-prices considerably (due to deletion of unnecessary ingredients) and thereby remove one of the important obstacles in rational drug-use.

6) Drug Supply to the public sector should be increased as per needs calculated rationally. Patients coming to the PHFs should not be required to buy medicines.

7) Continuing education of nurses about the drugs they use should take place. Periodic evaluation of their knowledge-status be made, as has been done in this study. Follow-up, corrective action should be taken up, based on the results of this evaluation. For use of contraceptive pill and IUCD, the check-list prepared by WHO should be used by nurses.

8) There should be a strict restriction on OTC sale of drugs. An expanded list of OTC drugs be prepared and only these drugs be allowed to be sold OTC. Information about OTC drugs

should be given in some detail to lay people though Govt. mass media.

9) The morbidity pattern of diseases reported at PHC OPD be worked out for each PHC, as has been done in this current study. Drug-requirement for each PHC for this level of morbidity load be worked on the basis of Standard Drug Treatment Regimens. These drug-requirements should be met by increased drug-supply. As shown in this study, this drug-requirement is not much as compared to the total expenses on PHCs (salaries, maintenance etc.). By adequately supplying drugs to PHCs, and using them judiciously and rationally, PHC's esteem in the eyes of the people would be considerably raised. The large amount of expenses incurred on infrastructure and salaries, etc., are today lying partly idle because PHCs remain under-utilized. The people's co-operation for preventive programmes would increase if the PHCs cater to the felt-needs of the people for curative/ symptomatic care.

10) There is a need to estimate the total drug requirement of the community, say per 10,000 population. For this, community-based morbidity data should be collected through systematic research. Drug requirement of the community for both preventive and curative/ symptomatic medical-care should be calculated on the basis of Standard Drug Treatment Regimens to be worked out for most of the illnesses found in the community.

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Appendix I

Cost of Drugs Supplied to PHC for Curative/Symptomatic care (1990-91) (Rs.)

Category of Drug and its Category number as per WHO E.D. List	Khatav 1990-91	Mayani 1990-91	Vaduz 1990-91	Indoli 1990-91	Aundh 1990-91	Bawdhan 1990-91	Bhunj 1990-91	Pimpode 1990-91	Undale 1990-91
1.2 Local Anaesthetics	NS	178.45	NS	400.00	448.00	80.00	360.00	80.00	400.00
2.1 Non-opoids	4151.97	1294.85	3543.51	4703.00	3271.16	2708.01	5293.83	7349.41	7028.69
2.2 Opiods	592.80	NS	NS	NS	690.00			NS	1605.00
3 Anti-allergics	18.00	NS	24.00	37.50	75.00	36.00	24.00	48.00	87.00
5 Anti-epileptics	NS	NS	NS	148.45	38.35			NS	38.35
6.1 Intestinal	137.00	137.00	616.50	237.85	411.00	274.00	342.50	274.00	NS
6.2.1 Penicillins	4172.50	4535.90	1382.00	1978.00	2002.00	1880.00	2154.75	2406.00	5891.00
6.2.2 Other Antibiotics	5107.60	11246.13	9613.16	20820.18	21200.32	8493.81	19050.42	10907.22	5950.14
6.2.4 Anti-tubercular	8101.00	10037.99	12169.49	NR	2077.50	NR	1428.84	1013.76	5836.92
6.4.1 Anti-amoebic	NS	185.00	185.00	NS	NS	185.00	370.00	NS	185.00
6.4.3 Anti-malarial						4770.04	6897.05		
8.3 Hormones	88.00	88.00	NS	149.60	NS	NS	132.00	382.00	141.90
10.1 Anti-anaemic	19039.00	NS	9722.75	NS	1290.30	2909.50	27603.50	NR	9318.77
11 Blood Products Subs	NS	NS	NS	NS	NS	NS	192.72		
12.3 Anti-hypertensive	NS	21.38	NS	21.38	21.38	NS	NS	8.55	21.38
12.5 Drugs in vascular shock	NS	406.26	NS	5.85	9.75	NS	12.19	4.87	4.87
13.1 Anti-fungal						NS	61.75		
13.2 Anti-infective	NS	NS	699.20	NS	763.00	NS	623.20	554.00	NS
13.6 Scabicides	143.50	NS	143.50	NS	NS			NS	NS
14 Diagnostics	NS	76.50	40.00	51.00	85.00	40.00	391.50	NS	142.00
15.1 Antiseptics			246.00	679.00	NS			1768.95	863.97
15.2 Disinfectants	290.00	NS	NS	482.00	396.50	61.00	586.00	58.00	870.00
17.1 Antacids	270.00	NS	420.00	300.00	NS	416.00	571.36	416.00	420.00
17.2 Anti-emetics	NS	NS	NS	NS	NS	NS	NS	NS	NS
17.5 Anti-spasmodic	247.00	247.00	1190.90	2626.30	881.60	420.00	1479.63	1730.00	3252.90
17.7.1 Electrolytes	NS	NS	3177.50	5592.40	5360.75	3895.00	4920.00		
19.2 Sera	510.90	1226.16	1532.70	613.00	2656.68			510.90	3985.02
19.3.2 Specific vaccines	1752.00	2146.20			4272.60	569.40	NS	NS	1259.60
21.1 Anti-infective	NS	3202.50	207.00	60.00	180.00	15.00	37.50	90.00	292.50
22.1 Oxytocic	2400.00	2400.00	262.15	74.90	NS	4800.00	381.99	224.70	224.70
24 Psychoterapeutics	16.00	7.88	28.55	572.29	28.27	129.20	16.00	NS	52.55
25.1 Anti-asthmatic					188.75			NS	75.50
25.2 Anti-tussive						548.70	457.25		
26 IV infusions	811.20	865.28	324.48	485.60	245.56	251.77	1792.32	135.20	2230.80
26.3 Misc.		214.40			270.00	90.00	360.00	100.50	
27 Vitamins	328.00	209.25	391.25	1750.00	104.00	501.75	1859.25	467.50	986.00
AYURVEDIC		64.00	192.00	128.00	128.00	NS	128.00	192.00	NS
SURGICALS		140.00				378.25	2045.74	2433.50	4824.03
TOTAL	48176.55	38930.13	38930.13	41836.38	47096.27	33452.43	78773.29	31155.86	55188.59

Note : N.S. - Not Supplied N.R. - No Records

Blank spaces - that category of drug was never supplied and probably not meant to be supplied

Cost of Drugs Supplied to PHC for Curative/Symptomatic care (1991-92) (Rs.)

Category of drug and its category no. as per WHO Essential Drug List	Khatav 1991-92	Mayani 1991-92	Vaduz 1991-92	Indoli 1991-92	Aundh 1991-92	Bawdhan 1991-92	Bhunj 1991-92	Pimpode 1991-92	Undale 1991-92
1.2 Local Anaesthetics	NS	260.00	NS	NS	120.00	NS	240.00	NS	480.00
2.1 Non-opoids	1500.67		3104.01	3444.74	8061.19	2944.63	3490.77	4341.89	3149.73
2.2 Opiods	688.40	NS	NS	NS	240.00			NS	930.00
3 Anti-allergics	90.00	72.00	178.00	193.50	306.00	264.00	226.50	108.00	369.00
5 Anti-epileptics	NS	NS	NS	102.92	NS			NS	NS
6.1 Intestinal	137.00	137.00	137.00	137.00	137.00	NS	118.90	NS	NS
6.2.1 Penicillins	NS	3306.00	1410.00	1410.00	1696.00	2368.00	3937.20	1510.00	3263.00
6.2.2 Other Antibiotics	11818.74	9350.88	3300.00	9856.60	15102.65	6295.38	11527.86	14075.78	14892.34
6.2.4 Anti-tubercular	1482.93	5380.70	NR	NR	3097.44	NR	2833.64	1490.39	6582.65
6.4.1 Anti-amoebic	185.00	868.00	470.55	185.00	555.00	NS	370.00	1110.00	740.00
6.4.3 Anti-malarial						6471.83	6455.70		
8.3 Hormones	114.40	88.00	NS	211.20	88.00	NS	88.00	220.00	94.60
10.1 Anti-anaemic	10018.25	NS	8963.75	NS	379.50	1802.62	1518.00	NR	126.50
11 Blood Products Subs	NS	NS	NS	NS	321.20	NS	256.96		642.40
12.3 Anti-hypertensive	NS	NS	NS	NS	NS	21.38	NS	NS	NS
12.5 Drugs in vascular shock	NS	NS	NS	4.87	NS	NS	NS	NS	4.87
13.1 Anti-fungal						NS	61.75		
13.2 Anti-infective	NS	841.40	52.20	61.20	1935.00	1000.00	1967.00	1000.00	1755.00
13.6 Scabicides	14.35	143.50	NS	NS	NS	11.00	22.00	NS	157.85
14 Diagnostics	NS	273.00	297.50	NS	171.00	120.00	672.50	NS	213.50
15.1 Antiseptics			728.35	652.80	793.05	150.00	1188.45	4870.88	1176.80
15.2 Disinfectants	NS	1200.50	130.00	NS	579.50	366.00	420.00	1019.00	1276.00
17.1 Antacids	120.00	18.40	284.00	700.00	183.00	520.00	292.10	312.00	180.00
17.2 Anti-emetics	165.00	9.00	NS	NS	NS	NS	NS	NS	NS
17.5 Anti-spasmodic	423.70		NS	2256.00	181.40	75.00	534.00	837.30	3803.20
17.7.1 Electrolytes	NS	1025.00	717.50	1353.00	410.00	820.00	640.00		
19.2 Sera	NS	NS	NS	1123.90	NS			1021.80	1021.80
19.3.2 Specific vaccines	1533.00	2934.60			657.00	744.60	8240.00	206.00	2331.00
21.1 Anti-infective	NS	45.00	45.00	22.50	NS	NS	NS	37.50	45.00
22.1 Oxytocic	3000.00	2400.00	112.35	112.35		2400.00	149.00	224.70	74.90
24 Psychoterapeutics	NS	37.82	18.27	19948.48	513.75	NS	129.20	8.00	4.00
25.1 Anti-asthmatic					75.50			NS	NS
25.2 Anti-tussive						585.28	182.90		
26 IV infusions	81.12	135.20		67.60	2615.22	1352.00	26.31	324.48	4339.92
26.3 Musc.	661.00			1663.37	450.00	90.00	405.00		
27 Vitamins					1456.00	829.50	502.75	510.00	598.00
AYURVEDIC		175.00		985.00	128.00	331.00	783.00	175.00	308.00
SURGICALS		684.00				234.25	3435.59	1613.00	13951.09
TOTAL	31953.56	29457.00	19948.48	44500.11	48252.48	29868.47	50715.00	35095.72	62511.15

Note : N.S. - Not supplied NR - No Records

Blank spaces - that category of drug was never supplied and probably not meant to be supplied

Appendix - III

Cost of Drugs Supplied to PHCs for Curative Symptomatic Care (Rs.).
(Sample = 9 PHCs) - 1990-92

Category of Drug and its category number as per WHO Essential Drug List	Total Cost (1990-92)	Average Cost Per PHC Per Year	% of Total Cost
1.2 Local Anaesthetics	3046.45	169.25	0.03%
2.1 Non-opoids	69382.06	3854.56	9.44%
2.2 Opiods	4666.20	259.23	0.63%
3 Anti-allergics	2156.50	119.81	0.29%
5 Anti-epileptics	328.07	18.23	0.04%
6.1 Intestinal	3233.75	179.65	0.44%
6.2.1 Penicillins	45302.45	2516.80	0.16%
6.2.2 Other Antibiotics	208599.41	11588.86	28.39%
6.2.4 Anti-tubercular	61533.33	3418.51	8.37%
6.4.1 Anti-amoebic	5593.65	310.76	0.76%
6.4.3 Anti-malarial	23794.92	1321.94	3.23%
8.3 Hormones	1885.70	104.76	0.25%
10.1 Anti-anaemic	92692.44	5149.58	12.61%
11 Blood Products Subs	1413.28	78.52	0.19%
12.3 Anti-hypertensive	115.45	6.41	0.01%
12.5 Drugs in vascular shock	453.53	25.20	0.06%
13.1 Anti-fungal	123.50	6.86	0.01%
13.2 Anti-infective	11412.80	634.04	0.55%
13.6 Scabicides	635.70	35.32	0.08%
14 Diagnostics	2573.50	142.97	0.25%
15.1 Antiseptics	13119.05	728.84	1.78%
15.2 Disinfectants	7814.50	434.14	1.06%
17.1 Antacids	5422.86	301.27	0.73%
17.2 Anti-emetics	174.00	9.67	0.02%
17.5 Anti-spasmodic	20185.93	1121.44	2.74%
17.7.1 Electrolytes	27911.25	1550.63	3.79%
19.2 Sera	14203.02	789.06	1.93%
19.3.2 Specific vaccines	26646.20	1480.34	3.62%
21.1 Anti-infective	4279.50	237.75	0.58%
22.1 Oxytocic	19242.54	1069.03	2.61%
24 Psychoterapeutics	1561.78	86.77	0.21%
25.1 Anti-asthmatic	339.75	18.88	0.46%
25.2 Anti-tussive	1774.13	98.56	0.24%
26 IV infusions	13313.58	739.64	1.81%
26.3 Misc.	1765.50	98.08	0.24%
27 Vitamins	7734.75	429.71	1.05%
AYURVEDIC	2173.00	120.72	0.29%
SURGICALS	28115.45	1561.97	3.82%
TOTAL	**710924.56**	**39495.80**	**100.00**

Cost of Drugs Supplied to Rural Hospitals (1990-92)(Rs.)

Category of drug and its category number as per WHO Essential Drug List	Pimpode 1990-92	Vaduz 1990-92	Wai 1990-92	Cost Total	Cost Average	Total % of Cost
1 Anaesthetics						
1.2 Local Anaesthetics	1636.50	1281.25	1411.00	4328.75	721.46	0.73%
2 Analgesics	0.00	0.00	0.00	0.00	0.00	0.00%
2.1 Non-opoids	9038.00	4870.00	18311.00	32219.00	5369.83	5.42%
2.2 Opiods	1966.09	154.00	7667.35	9787.44	1631.24	1.65%
3 Anti-allergics	1785.00	472.00	2027.00	4284.00	714.00	0.72%
6 Anti-infectives	0.00	0.00	0.00	0.00	0.00	0.00%
6.1 Intestinal	297.50	0.00	128.85	426.35	71.06	0.07%
6.2 Antibacterial	0.00	0.00	0.00	0.00	0.00	0.00%
6.2.1 Penicillins	39167.35	6871.50	22796.45	68835.30	11472.55	11.57%
6.2.2 Other Antibiotics	33084.33	16066.81	40909.32	90060.46	15010.08	15.14%
6.2.4 Anti-tubercular	33161.54	0.00	0.00	33161.54	5526.92	5.57%
6.4 Anti-protozoal	0.00	0.00	0.00	0.00	0.00	0.00%
6.4.1 Anti-amoebic	6806.80	728.00	14951.50	22486.30	3747.72	3.78%
8.3 Hormones	2873.75	0.00	1709.50	4583.25	763.88	0.77%
10.1 Anti-anaemic	0.00	0.00	1575.05	1575.05	262.51	0.26%
11 Blood Products Subs	734.58	0.00	2566.70	3301.28	550.21	0.55%
12 Cardiovascular	0.00	0.00	0.00	0.00	0.00	0.00%
12.1 Anti-anginal	0.00	0.00	0.00	0.00	0.00	0.00%
12.3 Anti-hypertensive	0.00	0.00	443.80	443.80	73.97	0.07%
12.5 Drugs in vascular shoc	57.88	1075.10	173.36	1306.34	217.72	0.22%
13 Dermatologicals	0.00	0.00	0.00	0.00	0.00	0.00%
13.2 Anti-infective	1557.16	481.68	3963.68	6002.52	1000.42	1.01%
13.6 Scabicides	0.00	538.15	1820.55	2358.70	393.12	0.40%
14 Diagnostics	535.50	0.00	0.00	535.50	89.25	0.09%
15 Disinfectants/Antisept	0.00	0.00	0.00	0.00	0.00	0.00%
15.1 Antiseptics	904.02	1807.86	2409.73	5121.61	853.60	0.86%
15.2 Disinfectants	1221.00	341.52	2125.00	3687.52	614.59	0.62%
15 Pot. Perm	936.32	0.00	1852.08	2788.40	464.73	0.47%
16 Diuretics	1891.46	0.00	185.47	2076.93	346.16	0.35%
17 Gastro-intestinal	0.00	73.50	130.00	203.50	33.92	0.03%
17.1 Antacids	0.00	0.00	816.00	816.00	136.00	0.14%
17.2 Anti-emetics	820.30	0.00	30.00	850.30	141.72	0.14%
17.5 Anti-spasmodic	3384.33	250.00	8920.26	12554.59	2092.43	2.11%
17.6 Carthartic	0.00	69.00	55.60	124.60	20.77	0.02%
17.7.1 Electrolytes	1657.10	113.50	1486.85	3257.45	542.91	0.55%
19 Immunologics	0.00	0.00	0.00	0.00	0.00	0.00%
19.2 Sera	1653.00	0.00	23417.50	25070.50	4178.42	4.21%
19.3 Vaccines(TT)	38558.80	0.00	0.00	38558.80	6426.47	6.48%
19.3.2 Specific vaccines (ARV	10960.67	12374.95	0.00	23335.62	3889.27	3.92%
20 Muscle relaxants	47.60	0.00	600.66	648.26	108.04	0.11%
21 Opthalmic	0.00	0.00	0.00	0.00	0.00	0.00%
21.1 Anti-infective	931.75	721.50	1304.15	2957.40	492.90	0.50%
22 Oxytocic Antoxytocic	0.00	0.00	0.00	0.00	0.00	0.00%
22.1 Oxytocic	1246.33	185.44	1523.67	2955.44	492.57	0.50%
24 Psychoterapeutics	46.20	0.00	1381.22	1427.42	237.90	0.24%
25 Respiratory	0.00	0.00	0.00	0.00	0.00	0.00%
25.1 Anti-asthmatic	1001.60	32.00	557.75	1591.35	265.23	0.27%
25.2 Anti-tussive	0.00	1761.00	0.00	1761.00	293.50	0.30%
26 IV infusions	16283.08	2055.09	35349.20	53687.37	8947.90	9.02%
26.3 Misc.	1575.00	150.00	1500.00	3225.00	537.50	0.54%
27 Vitamins	10600.50	6472.66	62060.26	79133.42	13188.90	13.30%
II AYURVEDIC	0.00	0.00	0.00	0.00	0.00	0.00%
III SURGICALS	23183.55	1936.78	18305.66	43425.99	7237.67	7.30%
TOTAL	**249604.59**	**60883.29**	**284466.17**	**594954.05**	**99159.01**	**100.00%**

Appendix V

Cost of Drugs Supplied to Cottage Hospital (Karad)

For curative/Symptomatic Care (Rs.)

Category of Drug and its category number	Cost 90-91	Cost 91-92	Total Cost 90-92	As % of total cost
1.1 G. Anaesthetic	1280.80	440.40	1721.20	0.40%
1.2 L. Anaesthetics	116.90	742.00	858.90	0.20%
2.1 Non-opoids	6066.46	10019.15	16085.61	3.74%
2.2 Opiods	478.40	1204.00	1682.40	0.39%
3 Anti-allergics	350.00	350.00	700.00	0.16%
5 Anti-epileptics	-	500.00	500.00	0.12%
6.1 Antihelmenthics	-	2007.80	2007.80	0.47%
6.2.1 Penicillins	23309.76	36329.86	59639.62	13.86%
6.2.2 Other Antibiotics	25486.48	34310.44	59796.92	13.90%
6.2.4 Anti-tubercular	-	1610.00	1610.00	0.37%
6.4.1 Anti-amoebic	3274.56	2745.60	6020.16	1.40%
6.4.5 Insect Repellant	609.00	1305.00	1914.00	0.44%
10 Blood Drugs Affecting		3980.00	3980.00	0.93%
11 Blood Products Subs	576.00		576.00	0.13%
12.1 Anti-anginal		135.00	135.00	0.03%
12.2 Anti-dysrhythmics		10.00	10.00	0.00%
12.3 Anti-hypertensive	19.30	61.64	80.94	0.02%
12.4 Cardiac Glycoside				
12.5 Drugs in vascular shock	495.00	9.80	504.80	0.12%
13.1 Antifungal		60.72	60.72	0.01%
13.2 Anti-infective		1800.00	1800.00	0.42%
13.6 Scabicides	330.24	1376.00	1706.24	0.40%
15 Disinfectant Antiseptics				
15.1 Antiseptics	1256.00	379.08	1635.08	0.38%
15.2 Disinfectants	1267.80	7560.00	8827.80	2.05%
16 Diuretics	285.12	156.80	441.92	0.10%
17.1 Antacids	2565.00	2595.00	5160.00	1.20%
17.5 Anti-spasmodic	480.00	720.00	1200.00	0.28%
17.7 Anti-diarrhoeal	1494.00	1660.00	3154.00	0.73%
19.2 Sera	14317.50	12450.00	26767.50	6.22%
19.3 Vaccines	765.00	56.50	821.50	0.19%
19.3.2 Specific Vaccine	12663.60	20125.24	32788.84	7.62%
20 Muscle relaxants		16.60	16.60	0.00%
21.1 Anti-infective	445.00	1294.00	1739.00	0.40%
22.1 Oxytocic Anti-oxytocic	1694.97	67.60	1762.57	0.41%
24 Psychoterapeutics	182.75	299.50	482.25	0.11%
25.1 Anti-asthmatic	614.45	864.20	1478.65	0.34%
25.2 Anti-tussive	3516.50	9067.00	12583.50	2.93%
26 Infusion	29840.84	42184.74	72025.58	16.74%
27 Vitamins Minerals	6780.80	11638.90	18419.70	4.28%
SURGICALS	18367.00	61098.20	79465.20	18.47%
TOTAL	**158929.23**	**271230.77**	**430160.00**	**100.00%**

Cost of Drugs Supplied to Civil Hospital in Satara District

Drug Category and its category number as per WHO ED list	Cost 90-91	Cost 91-92	Total Cost	% of Total Cost
1.1 G. Anaesthetic	16522.00	11008.30	27530.30	0.80%
1.2 Local Anaesthetics	20940.08	14344.20	35284.28	1.02%
2.1 Non-opoids	50392.95	6793.25	57186.20	1.66%
2.2 Opiods	12168.00	4591.00	16759.00	0.49%
3 Anti-allergics	4686.50	10693.00	15379.50	0.45%
5 Anti-epileptics	2058.00	1369.52	3427.52	0.10%
6.1 Anti-infective intestinal	3472.00		3472.00	0.10%
6.2 Antibacterial penicillins	303452.90	140400.00	443852.90	12.86%
6.2.2 Other Antibiotics	147514.23	214236.00	361750.23	10.48%
6.2.3 Antileprosy	863.00		863.00	0.02%
6.2.4 Anti-tubercular	4950.00		4950.00	0.14%
6.4.1 Anti-amoebic	20540.00	9292.00	29832.00	0.86%
8.3 Hormones	18279.00	22529.00	40808.00	1.18%
9 Anti-Parkinsons		145.00	145.00	0.00%
10.1 Anti-anaemic	1056.00	6034.00	7090.00	0.21%
11 Blood Products Subs	284.00		284.00	0.01%
12 Cardiovascular		580.50	580.50	0.02%
12.1 Anti-anginal	561.20	915.90	1477.10	0.04%
12.2 Anti-dysrhythmics	240.00	2875.00	3115.00	0.09%
12.3 Anti-hypertensive	5464.00	4475.00	9939.00	0.29%
12.4 Cardiac Glycoside	515.58	51.75	567.33	0.02%
12.5 Drugs in vascular shock	1687.60	5919.60	7607.20	0.22%
13 Dermatologics	3304.00		3304.00	0.10%
13.2 Anti-infective		10851.00	10851.00	0.31%
13.6 Scabicides	3328.00	1328.00	4656.00	0.13%
15.1 Antiseptics	29766.30	40494.20	70260.50	2.04%
15.2 Disinfectants	19143.00	23846.05	42989.05	1.25%
16 Diuretics	7628.00	6119.80	13747.80	0.40%
17 Gastrointestinal	34.00		34.00	0.00%
17.1 Antacids	6318.00	4158.00	10476.00	0.30%
17.2 Anti-emetics	2234.50	3379.00	5613.50	0.16%
17.5 Anti-spasmodic	23190.00	20728.00	43918.00	1.27%
17.6 Cathartic		5087.00	5087.00	0.15%
17.7 Anti-diarrhoeal	7760.00	4272.00	12032.00	0.35%
18 Hormones	1570.39	4416.24	5986.63	0.17%
18.1 Adrenal	2370.00	273.00	2643.00	0.08%
19.2 Sera (Inj. ASV)	211650.00	156246.00	367896.00	10.66%
19.3.2 Vaccines (Cholera OTT & ARV)	91398.00	118599.00	209997.00	6.08%
20 Muscle relaxants	3363.15	1504.79	4867.94	0.14%
21 Ophthalmic	4257.00	1166.75	5423.75	0.16%
21.1 Anti-infective	18562.90	18554.40	37117.30	1.08%
22.1 Oxytocic	4882.00	9457.85	14339.85	0.42%
24 Psychoterapeutics	20466.38	23756.35	44222.73	1.28%
25.1 Anti-asthmatic	3562.75	22623.45	26186.20	0.76%
25.2 Anti-tussive	11769.71	9190.00	20959.71	0.61%
26 IV Infusions	297604.66	249810.14	547414.80	15.86%
26.3 Water for injection	2250.00	13668.00	15918.00	0.46%
27 Vitamins	61669.00	41069.80	102738.80	2.98%
SURGICALS	218247.90	533229.88	751477.78	21.77%
TOTAL	**1671976.68**	**1780081.72**	**3452058.40**	**100.00%**

Cost of Brand Drugs Supplied to Karad Cottage Hospital (1990-92)

	Drug Category and its Category number	Cost (Rs.)
2.10	Non opoids	
	(1) Oxalgin	44200.00
	(2) Inj Analgin	1640.00
6.1.1	Intestinal	
	Syp. Mebekin	1762.50
6.2.2	Other Antibiotics	
	Mix Cotrimoxazole	474.75
8.3	Hormones	
	Inj Idizone 4 mgl ml 2 m/amp	496.00
12.3	Antihypertensive	
	Tab Adelphane	48.45
	Tab Dylide	32.49
13.1	Antifungal	
	Oint Exora	60.72
15.1	Antiseptics	
15.2	Disinfectants	
17.1	Antacids	
	Mix Kaolin	2550.00
	Tab Antacid	2610.00
17.5	Antispasmodic	
	Inj Ridalpin	212.00
20	Inj Epidosyn 8mg/ml (one m/amp)	16.60
25.1	Anti-asthamatic	
	Inj Respiphylline	24.75
25.2	Antitussive	
	Sy cophekin	11316.50
26	IV Infusion	
	Inj Ringer Lactate	15285.12
	TOTAL	**80778.33**

Cost of Irrational Drugs Supplied to Karad Cottage Hospital 1990-92

Category. No.	Name of drug	Cost
2.1	Non opoids	
6.1.1	Intestinal	
	Syp. Mebekin	1762.50
6.4.1	Antiamoebic	
	Tab DHQ	3020.16
17.5	Antispasmodic	
	Inj Ridalpin	212.00
25.1	Anti-asthamatic	
	Inj Respiphylline	24.75
25.2	Antitussive	
	Sy. Cophekin	11316.50
	TOTAL	**16335.91**

Annexure - A-1

Standard Drug Treatment Regimens (SDTRs) and their Cost

Standard Drug Treatment Regimens (SDTRs) for common illnesses encountered at PHC level were prepared by consulting "Pharmacology and Pharmaco-therapeutics" (Satoskar et al, 11th edition) - the most widely used text book of pharmacology in India. Every doctor in India must have studied this text book. Other text books including Park's Textbook of Preventive and Social Medicine (12th edition) were referred. While choosing drugs, both the cost and effectivity were considered.

The cost of standard drug treatment was worked out on the basis of rates given in the rate contract for 1991. The "private rate" has been worked out from the prices given in the Current Index of Medical Specialities (CIMS) which gives commercial details of the major brands of the reputed companies. The cheapest brand as given in Jan-Apr issue of CIMS 1991 was selected for each of the drugs.

The dose, upto 5 years, and for 6 to 12 years, was assumed to be 1/3rd and 1/2 of the adult dose respectively. If a particular drug is not available in the government rate contract, the cheapest brand available in CIMS was chosen in its place. Such drugs have been marked with an asterisk.

For cases like dog-bite, diabetes, hypertension, leprosy, malaria, URIT, etc. the cost of treatment differs quite a bit according to the sub-type of the case; eg. in case of dog-bite, whether it is rabid or untraceable dog or not. Therefore, cost of treatment of two broad sub-types in such diseases was worked out separately. Then, a certain proportion between these two types of patients was assumed either based on available literature or based on experience in the field. Finally, a weighted average of the cost of treatment of these diseases was calculated.

Annexure : A-I

Standard Drug Treatment Regimens (SDTRs) for Most Common Illnesses
Reported at the PHC-OPD and its Cost at 1991 Rates

I	II	III	IV		V	VI		VII			VIII		
Sr.	Disease	No. of Drugs	Treatment		Total No Of Tablets	Unit Cost		Total Cost at Govt. Rate			Total Cost at Private Rate		
			Drugs	Dosage		Govt. Rate	Pvt. Rate	Adult	6-12 yrs	below 5 yrs	Adult	6-12yrs	below 5 yrs
1	Abcess/Cellulitis	3	Tb.Cotrimoxazole d.s	1bds x 5dys	10	0.65	1.48	6.50	3.25	2.17	14.80	7.40	4.93
			Tb.Aspirin 300mg	1tds x 3dys	9	0.05	0.21	0.45	0.23	0.15	1.89	0.95	0.63
			Magsulf dressing		1	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
	Total							8.95	5.48	4.32	18.69	10.35	7.56
2	Abdominal pain (colicky)	1	Tb.Belladona	1sos	4	0.07	0.14	0.28	0.14	0.09	0.56	0.28	0.19
	Total							0.28	0.14	0.09	0.56	0.28	0.19
3	Acid peptic disease	1	* Tb.Ranitidine 150mg	2hs x 45dys	90	1.90	1.90	171.00	not found in children		171.00	not found in children	
	Total							171.00	-	-	171.00	-	-
4	Allergic dermatitis	1	Tb.C.P.M 4mg	1tds x 3dys	9	0.02	0.08	0.18	0.09	0.06	0.72	0.36	0.24
			* Lot.Calamine 100ml	Apply sos	1	10.40	10.40	10.40	10.40	10.40	10.40	10.40	10.40
	Total							10.58	10.49	10.46	11.12	10.76	10.64
5	Allergic rash	1	Tb.C.P.M 4mg	1tds x 3dys	9	0.02	0.08	0.18	0.09	0.06	0.72	0.36	0.24
	Total							0.18	0.09	0.06	0.72	0.36	0.24

* Not included in the rate contract

I	II	III	IV		V	VI		VII			VIII		
Sr.	Disease	No. of Drugs	Treatment		Total No Of Tablets	Unit Cost		Total Cost at Govt. Rate			Total Cost at Private Rate		
			Drugs	Dosage		Govt. Rate	Pvt. Rate	Adult	6-12 yrs	below 5 yrs	Adult	6-12yrs	below 5 yrs
6	Allergic Cold	2	Tb.C.P.M 4mg	1tds x 3dys	9	0.02	0.08	0.18	0.09	0.06	0.72	0.36	0.24
			Tb.Paracetamol(a) 500mg	1tds x 3dys	9	0.16	0.25	1.44	0.72	0.48	2.25	1.13	0.75
	Total							1.62	0.81	0.54	2.97	1.49	0.99
7	Anaemia	1	Tb.Iron 200mg/Folic 0.5mg	1bd x 90dys	180	0.05	0.24	9.00	4.50	3.00	43.20	21.60	14.40
	Total							9.00	4.50	3.00	43.20	21.60	14.40
8	ANC	2	Tb.Iron 200mg/Folic 0.5mg	1od x 270 days	270	0.05	0.24	13.50	not found in children		64.60	not found in children	
			Tb. Multivitamin	1od x 15 dys	15	0.35	0.60	5.25			9.00		
			*Tb.Calcium with vitamin	1bd x 270	540	0.25	0.25	135.00	-	-	135.00	-	-
	Total							153.75	0.00	0.00	208.80	0.00	0.00
9	Anorexia	1	Tb.B Complex (a1)	1bds x 5dys	10	0.07	0.42	0.70	0.35	0.23	4.20	2.10	1.40
	Total							0.70	0.35	0.23	4.20	2.10	1.40
10	Anxiety Neurosis	1	Tb.Diazepam 5mg	1hs x 15dys	15	0.02	0.20	0.30	0.15	0.10	3.00	1.50	1.00
	Total							0.30	0.15	0.10	3.00	1.50	1.00
11	Amoebiasis	1	Tb.Metronidazole 400mg	1tds x 5dys	15	0.16	0.33	2.40	1.20	0.80	4.95	2.48	1.65
	Total							2.40	1.20	0.80	4.95	2.48	1.65
12	Amoebic dysentry and colicky pain	2	* Tb.Dicyclomine 10mg	1sos	4	0.59	0.59	2.36	1.18	0.79	2.36	1.18	0.79
			Tb.Metronidazole 400mg	1tds x 5dys	15	0.16	0.33	2.40	1.20	0.80	4.95	2.48	1.65
	Total							4.76	2.38	1.59	7.31	3.66	2.44

I	II	III	IV		V	VI		VII			VIII		
Sr.	Disease	No. of Drugs	Treatment		Total No Of Tablets	Unit Cost		Total Cost at Govt. Rate			Total Cost at Private Rate		
			Drugs	Dosage		Govt. Rate	Pvt. Rate	Adult	6-12 yrs	below 5 yrs	Adult	6-12yrs	below 5 yrs
13	Asthma	1	* Inh.Beclamethasone 200 metred doses	sos	1	60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00
	Total							60.00	60.00	60.00	60.00	60.00	60.00
14	Asthmatic bronchitis	2	Tb.Cotrimoxazole ds	1bds x 5dys	10	0.65	1.48	6.50	3.25	2.17	14.80	7.40	4.93
			Tb.Salbutamol 4mg	1tds x 5dys	15	0.06	0.50	0.90	0.45	0.30	7.50	3.75	2.50
	Total							7.40	3.70	2.47	22.30	11.15	7.43
15	Arthritis	1	Tb.Aspirin 300mg	2tds x 5dys	30	0.05	0.21	1.50	0.75	0.50	6.30	3.15	2.10
	Total							1.50	0.75	0.50	6.30	3.15	2.10
16	Bites	2	Ij.Tetanous toxoid		1	0.75	1.05	1.00	1.00	1.00	1.05	1.04	1.04
			Tb.Aspirin 300mg	1tds x 3dys	9	0.05	0.21	0.45	0.23	0.15	1.89	0.95	0.63
	Total							154.17	137.59	132.06	210.66	165.85	150.91
17	Boils	2	* Tb.Doxycycline 100mg	1od x 5dys	5	1.75	2.28	8.75	4.38	2.92	11.40	5.70	3.80
			Tb.Aspirin 300mg	1tds x 3dys	9	0.05	0.21	1.89	0.95	0.63	0.45	0.23	0.15
	Total							10.64	5.32	3.55	11.85	5.92	3.95
18	Body ache/headache	1	Tb.Paracetamol 500mg	1tds x 3dys	9	0.16	0.25	1.44	0.72	0.48	2.25	1.13	0.75
	Total							1.44	0.72	0.48	2.25	1.13	0.75

I	II	III	IV		V	VI		VII			VIII		
Sr.	Disease	No. of Drugs	Treatment		Total No Of Tablets	Unit Cost		Total Cost at Govt. Rate			Total Cost at Private Rate		
			Drugs	Dosage		Govt. Rate	Pvt. Rate	Adult	6-12 yrs	below 5 yrs	Adult	6-12yrs	below 5 yrs
19	Bronchitis	3	Tb.Cotrimoxazole ds	1bds x 5dys	10	0.65	1.48	6.50	3.25	2.17	14.80	7.40	4.93
			Tb.Paracetamol 500mg	1tds x 3dys	9	0.16	0.25	1.44	0.72	0.48	2.25	1.13	0.75
			Tb.Salbutamol 4mg	1hs x 5	5	0.06	0.50	0.30	0.15	0.10	2.50	1.25	0.83
	Total							7.94	3.97	2.65	17.05	8.53	5.68
20	Blocked nose	1	Nasal drops 1% Saline	sos (home made)	1	-	-	-	-	-	-	-	-
21	Caries dental(infected)	2	Tb.Cotrimoxazole ds	1bds x 5dys	10	0.65	1.48	6.50	3.25	2.17	14.80	7.40	4.93
			* Tb.Ibuprofen 400mg	1tds x 5dys	15	0.40	0.40	6.00	3.00	2.00	6.00	3.00	2.00
	Total							12.50	6.25	4.17	20.80	10.40	6.93
22	Chickenpox	2	Tb.Paracetamol 500mg	1/2tds x 5dys	10	0.16	0.25	1.60	0.80	0.53	2.50	1.25	0.83
			Tb.Chlorpheniramine Mal.4mg	1/2bd x 5dys	5	0.02	0.08	0.10	0.05	0.03	0.40	0.20	0.13
	Total							1.70	0.85	0.57	2.90	1.45	0.97
23	Common cold	2	Tb.Paracetamol 500mg	1tds x 3dys	9	0.16	0.25	1.44	0.72	0.48	2.25	1.13	0.75
			Tb.Chlorpheniramine Mal.4mg	1sos	4	0.02	0.08	0.08	0.04	0.03	0.32	0.16	0.11
	Total							4.92	2.46	1.64	8.37	4.19	2.79
24	Cold cough	3	Tb.Paracetamol 500mg	1tds x 3dys	9	0.16	0.25	1.44	0.72	0.48	2.25	1.13	0.75
			* Tb.Codeine 10mg	1bds x 3dys	6	0.20	0.20	1.20	0.60	0.40	1.20	0.60	0.40
	Total							2.64	1.32	0.88	3.45	1.73	1.15
25	Conjunctivitis	1	*Eye oint.Oxytetracycline 3.5g	apply 3-4times a day	1	1.45	1.45	1.45	1.45	1.45	1.45	1.45	2.10
	Total							1.45	1.45	1.45	1.45	1.45	2.10

I	II	III	IV		V	VI		VII			VIII		
Sr.	Disease	No. of Drugs	Treatment		Total No Of Tablets	Unit Cost		Total Cost at Govt. Rate			Total Cost at Private Rate		
			Drugs	Dosage		Govt. Rate	Pvt. Rate	Adult	6-12 yrs	below 5 yrs	Adult	6-12yrs	below 5 yrs
26	Constipation	1	Tb.Bisacodyl 5mg	2hs	2	0.10	0.36	0.20	0.10	0.07	0.72	0.36	0.24
	Total							0.20	0.10	0.07	0.72	0.36	0.24
27	Contusion (blunt injury)	1	Tb.Aspirin 300mg	1tds x 7dys	21	0.05	0.21	1.05	0.53	0.35	4.41	2.21	1.47
	Total							1.05	0.53	0.35	4.41	2.21	1.47
28	CLW (Contused & Lacerated Wound)	2	Tb.Aspirin 300mg	1tds x 2dys	6	0.05	0.21	0.30	0.15	0.10	1.26	0.63	0.42
			Inj.TT	0.5ml stat	2	0.75	1.04	1.50	1.50	1.50	2.08	2.08	2.08
			Dressing	Repeat after 1mont	1	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
	Total							3.80	3.65	3.60	5.34	4.63	4.50
29	Depression	1	* Tb.Imipramine 25mg	2bd x 180dys	720	0.70	0.70	504.00	252.00	168.00	504.00	252.00	168.00
	Total							504.00	252.00	168.00	504.00	252.00	168.00
30	Diarrhoea	2	Pow.ORS	2packets	2	1.60	3.00	3.20	1.60	1.60	6.00	3.00	2.00
			Tab.Furazolidone 100mg	1tds x 5dys	15	0.10	0.23	1.50	0.75	0.50	3.45	1.73	1.15
	Total(A)							A 4.70	A 2.35	A 2.10	A 9.45	A 4.73	A 3.15
31	Diarrhoea (b)	2	Pow.ORS	2packets	2	1.60	3.00	3.20	1.60	1.60	6.00	3.00	3.00
	Total(B)							B 3.20	B 1.60	B 1.60	B 6.00	B 3.00	B 2.00
	Weighted Average [1x(A)+3x(B)]x0.25							3.57	1.78	1.19	6.86	3.43	2.28

I	II	III	IV		V	VI		VII			VIII		
Sr.	Disease	No. of Drugs	Treatment		Total No Of Tablets	Unit Cost		Total Cost at Govt. Rate			Total Cost at Private Rate		
			Drugs	Dosage		Govt. Rate	Pvt. Rate	Adult	6-12 yrs	below 5 yrs	Adult	6-12yrs	below 5 yrs
32	Diarrhoea, Fever	3	Pow.ORS	2pkts	2	1.60	3.00	3.20	1.60	1.60	6.00	3.00	2.00
			Tab.Furazolidone 100mg	1tds x 5dys	15	0.10	0.23	1.50	0.75	0.50	3.45	1.73	1.15
			Tb.Paracetamol 500mg	1tds x 3dys	10	0.16	0.25	1.60	0.80	0.53	2.50	1.25	0.83
	Total							6.30	3.15	2.63	11.95	5.98	3.98
33	Diarrhoea, Colicky pain	3	Pow.ORS	2pkts	2	1.60	3.00	3.20	1.05	1.05	6.00	3.00	2.00
			Tab.Furazolidone 100mg	1tds x 5dys	15	0.10	0.23	1.50	0.75	0.50	3.45	1.73	1.15
			Tb.Belladona	1sos	4	0.07	0.14	0.28	0.14	0.09	0.56	0.28	0.19
	Total							4.98	1.94	1.64	10.01	5.01	3.34
34	Diarrhoea, Vomiting	2	Pow.ORS	2pkts	2	1.60	3.00	3.20	1.05	1.05	6.00	3.00	2.00
			* Tb.Metoclopramide 10mg	1stat, sos	4	0.40	0.40	1.60	0.80	0.53	1.60	0.80	0.53
	Total							4.80	1.85	1.58	7.60	3.80	2.53
35	Bacillary Dysentry; (bloody diarrhea due to bacterial infection)	3	Pow.ORS	2pkts	2	1.60	3.00	3.20	1.05	1.05	6.00	3.00	2.00
			Tb.Cotrimoxazole ds	1bds x 5dys	10	0.65	1.48	6.50	3.25	2.17	14.80	7.40	4.93
			Tb.Belladona	1sos	4	0.07	0.14	0.28	0.14	0.09	0.28	0.14	0.07
	Total							9.98	4.44	3.31	21.08	10.54	7.00
36	Diabetes (on oral medication) (C)	1 (C)	* Tb.Chlorpropamide 100mg	1bds x 365dys	730	0.18	0.18	131.40	Not in children		131.40	Not in children	
	Total							A 131.40	A Not in children	A	A 131.40	A Not in children	

I	II	III	IV		V	VI		VII			VIII		
Sr.	Disease	No. of Drugs	Treatment		Total No Of Tablets	Unit Cost		Total Cost at Govt. Rate			Total Cost at Private Rate		
			Drugs	Dosage		Govt. Rate	Pvt. Rate	Adult	6-12 yrs	below 5 yrs	Adult	6-12yrs	below 5 yrs
37	Diabetes (on insulin)	1	Ij.Insulin zinc (Lente)	16i.u daily	365	5.00	5.00	1825.00	912.50	608.33	1825.00	912.50	608.33
								B	B	B	B	B	
	Total							1825.00	912.50	608.33	1825.00	912.50	608.33
	Weighted Average ((4xA) + (1xB)) x 0.2							470.12	912.50	608.33	470.12	912.50	608.33
38	Dogbite (Dog rabid or not traceable)	3	Inj.Antirabies Vaccine 30ml.	5ml x 14dys	2	43.00	130.00	86.00	43.00	43.00	260.00	130.00	130.00
			Inj.Tetanous toxoid	1stat (repeat next month)	2	0.75	1.04	1.50	1.50	1.50	2.08	2.08	2.08
			Tab. Paracetamol	1 tds x 3 dys.	9	0.16	0.25	1.44	0.72	0.48	2.25	1.13	0.75
										A	A	A	A
	Total							A 88.94	A 45.22	44.98	264.33	133.21	132.83
39	Dogbite (Dog apparently healthy and under observation)	3	Inj.Antirabies Vaccine 30ml.	5ml x 5dys	1	43.00	130.00	43.00	21.50	21.50	130.00	65.00	65.00
			Inj.Tetanous toxoid	1stat repeat next month	2	0.75	1.04	1.50	1.50	1.50	2.08	2.08	2.08
			Tb.Paracetamol 500mg	1tds x 3dys To repeat after 1	9	0.16	0.25	1.44	0.72	0.48	2.25	1.13	0.75
										B	B	B	B
	Total					43.91	131.29	B 45.94	B 23.72	23.48	134.33	68.205	67.83
	Weighted Average ((4xB) + (1xA)) x 0.2							54.54	28.02	27.78	160.33	81.21	80.83
40	Enteric Fever	1	* Tb.Ciprofloxacin 500mg	1bds x 14dys	28	19.15	19.15	536.20	268.10	178.73	536.20	268.10	178.73
	Total							536.20	268.10	178.73	536.20	268.10	178.73

I	II	III	IV		V	VI		VII			VIII		
Sr.	Disease	No. of Drugs	Treatment		Total No Of Tablets	Unit Cost		Total Cost at Govt. Rate			Total Cost at Private Rate		
			Drugs	Dosage		Govt. Rate	Pvt. Rate	Adult	6-12 yrs	below 5 yrs	Adult	6-12yrs	below 5 yrs
41	Epilepsy	1	* Tb.Phenytoin Sodium 100	1tds x 365dys	1095	0.12	0.12	131.40	65.70	43.80	131.40	65.70	43.80
	Total							131.40	65.70	43.80	131.40	65.70	43.80
42	Eczema	2	* Oint.Betamethasone		1	10.20	10.20	10.20	5.10	3.40	10.20		
			Tb.CPM 4mg	1tds x 15dys	45	0.02	0.08	0.90	0.45	0.30	3.60	1.80	1.20
	Total							11.10	5.55	3.70	13.80	1.80	1.20
43	Fever	1	Tb.Paracetamol 500mg	1tds x 3dys	9	0.16	0.25	1.44	0.72	0.48	2.25	1.13	0.75
	Total							1.44	0.72	0.48	2.25	1.13	0.75
44	Foreign body in the eye	3	* P/D Xylocaine	2 Drops									
			E/D Sulphacetamide	2 drops 4times/day	1	1.85	6.61	1.85	1.85	1.85	6.61	6.61	6.61
			Tb.Aspirin 300mg	1tds x 3dys	9	0.05	0.21	0.45	0.23	0.15	1.89	0.95	0.63
	Total							2.30	2.08	2.00	8.50	7.56	7.24
45	Filariasis or Tropical eosinophilia	1	* Tb.Diethyl Carbamazine Citrate 100mg	1tds x 21	63	0.072	0.1	4.54	2.27	1.51	6.30	3.15	2.10
	Total							5.54	2.27	1.51	6.30	3.15	2.10
46	Fungal infection in Ear	2	* Eye drops Clotrimazole	2drops 3times/dy	1	14.32	14.32	14.32	9.00	9.00	14.32	9.00	9.00
			Tb.Aspirin 300mg	1tds x 3dys	9	0.05	0.21	0.45	0.23	0.15	1.89	0.95	0.63
47	Glaucoma	1	* Eye drops Timolol 0.25%		1	12.64	12.64	12.64	not found in children		12.64	not found in children	
	Total							14.77	9.23	9.15	16.21	9.95	9.63

I	II	III	IV		V	VI		VII			VIII		
Sr.	Disease	No. of Drugs	Treatment		Total No Of Tablets	Unit Cost		Total Cost at Govt. Rate			Total Cost at Private Rate		
			Drugs	Dosage		Govt. Rate	Pvt. Rate	Adult	6-12 yrs	below 5 yrs	Adult	6-12yrs	below 5 yrs
48	Hepatitis (Infective)	3	Tb.Paracetamol 500mg	1tds x 3dys	9	0.16	0.25	1.44	0.72	0.48	2.25	1.13	0.75
			Tb.CPM 4mg	1sos	4	0.02	0.08	0.08	0.04	0.03	0.32	0.16	0.11
			Tb.Multivitamin	1od 7dys	7	0.35	0.60	2.45	1.22	0.82	4.20	2.10	1.40
	Total							3.97	1.98	1.32	6.77	3.39	2.26
49	Hypertension	1	* Tb.Atenolol 50mg	1od x 365dys	365	0.80	0.80	292.00	not in children		292.00	not in children	
	Total							A 292.00	A not in children	A	A 292.00	A not in children	A
50	Hypertension	1	* Tb.Hydrochlorothiazid	1od x 365dys	365	0.2	0.2	73	not foundin children		73	not found in children	
	Total							B 73	B	B	B 73	B	B
	Weighted Average [2x(A)+1x(B)]x.33							216.81			218.81		
51	Indigestion (d)	1	Tb. Antacid	2qid x 3days	24	0.06	0.13	1.44	0.72	0.48	3.12	1.56	1.04
	Total							1.44	0.72	0.48	3.12	1.56	1.04
52	Infected wound	3	Tb.Cotrimoxazole ds	1bds x 5dys	10	0.65	1.48	6.50	3.25	2.17	14.80	7.40	4.93
			Tb.Aspirin 300mg	1tds x 3dys	9	0.05	0.21	0.45	0.23	0.15	1.89	0.85	0.63
			Dressing	..	1	2.00	2.00	2.00	2.00	2.00	5.00	5.00	5.00
	Total							8.95	5.48	4.32	21.69	13.25	10.56

I	II	III	IV		V	VI		VII			VIII		
Sr.	Disease	No. of Drugs	Treatment		Total No Of Tablets	Unit Cost		Total Cost at Govt. Rate			Total Cost at Private Rate		
			Drugs	Dosage		Govt. Rate	Pvt. Rate	Adult	6-12 yrs	below 5 yrs	Adult	6-12yrs	below 5 yrs
53	Ischemic heart disease	2	• Tb.Sorbitrate 10 mg	1bd x 5 days	10	0.14	0.14	1.40	not found in children		1.40	not found in children	
			Tb.Aspirin 300mg	1/4od x 365days	91	0.05	0.21	4.55			19.11		
	Total							5.95	0.00	0.00	20.51	0.00	0.00
54	Leucorrhea / Vaginitis	1	• Pess.Betadine	1bbd x 7dys	14	2.08	2.08	29.12	14.56	9.71	29.12	14.56	9.71
	Total							29.12	14.56	9.71	29.12	14.56	9.71
55	Leprosy (paucibacillary)	2	Tb.Rifampicin 600mg	1od 1dy/mth x 6	6	3.55	5.15	21.30	10.65	7.10	30.90	15.45	10.30
			Tb.Dapsone 100mg	1od 12mths	365	0.01	0.06	3.65	1.83	1.22	21.90	10.95	7.30
	Total							A 24.95	A 12.48	A 8.32	A 52.80	A 26.40	A 17.60
56	Leprosy (multibacillary)	3	Tb.Rifampicin 600mg	1od x 15dys	15	3.55	5.15	53.25	26.63	17.75	77.25	38.63	25.75
			"	1od 1/mth x 12	12	3.55	5.15	42.6	21.3	14.2	61.8	30.9	28.6
			Tb.Dapsone 100mg	1od 365dys	365	0.01	0.06	3.65	1.83	1.22	21.90	10.95	7.30
			• Tb.Clofazimine 50mg	1od 365dys	365	0.85	0.85	310.25	155.13	103.42	310.25	155.13	103.42
	Total							B 409.75	B 204.88	B 136.88	B 471.20	B 235.60	B 157.07
	Weighted Average [4x(A)+1x(B)]x0.2							181.75	90.88	60.58	305.44	152.72	101.84
57	LRTI (Lower Respiratory Tract Infection)	2	Tb.Cotrimoxazole ds	1bds x 5dys	10	0.65	1.48	6.50	3.25	2.17	14.80	7.40	4.93
			Tb.Paracetamol 500mg	1tds x 3dys	9	0.16	0.25	1.44	0.72	0.48	2.25	1.13	0.75
	Total							7.94	3.97	2.65	17.05	8.53	5.68

I	II	III	IV		V	VI		VII			VIII		
Sr.	Disease	No. of Drugs	Treatment		Total No Of Tablets	Unit Cost		Total Cost at Govt. Rate			Total Cost at Private Rate		
			Drugs	Dosage		Govt. Rate	Pvt. Rate	Adult	6-12 yrs	below 5 yrs	Adult	6-12yrs	below 5 yrs
58	Lymphadinitis	2	Tb.Cotrimoxazole ds	1bds x 5dys	10	0.65	1.48	6.50	3.25	2.17	14.80	7.40	4.93
			Tb.Paracetamol 500mg	1tds x 3dys	9	0,16	0.25	1.44	0.72	0.48	2.25	1.13	0.75
	Total							7.94	3.97	2.65	17.05	8.53	5.68
59	Malaria (P.vivax,P.ovale)	1	Tb.Chloroquine 150mg	4st,2tb after 6hrs 1bds x 2dys	10	0.36	0.40	3.60	1.80	1.20	4.00	2.00	1.33
			* Tb.Primaquin 7.5mg	1bds x 5dys	10			0.00	0.00	0.00	0.00	0.00	
	Total							3.60	1.80	1.20	4.00	2.00	1.33
60	Malaria (Falciparum)	1	Tb.Chloroquine 150mg	4st,2tb after 6hrs 1bds x 2dys	10	0.36	0.40	3.60	1.80	1.20	4.00	2.00	1.33
	Total							B 3.60	B 1.80	B 1.20	B 4.00	B 2.00	B 1.33
	Weighted Average [4x(A)+1x(B)]x0.2							5.04	2.52	1.68	5.44	2.72	1.81
61	Measles	2	Tb.Paracetamol 500mg	1/2tds x 5dys	8	0.16	0.25	1.28	0.64	0.43	2.00	1.00	0.67
			*Cp.Vitamin A 50,000 i.u	1od x 21dys	21	0.68	0.68	14.28	14.28	14.28	14.28	14.28	14.28
	Total							15.56	14.92	14.71	16.28	15.28	14.95
62	Migraine	2	* Tb.Ibuprofen 400mg	1sos 6	6	0.48	0.48	2.88	1.44	0.96	2.88	1.44	0.96
			* Tb.Metoclopromide 10mg	1sos 6	6	0.40	0.40	2.40	1.20	0.80	2.40	1.20	0.80
	Total							5.28	2.64	1.76	5.28	2.64	1.76

I	II	III	IV		V	VI		VII			VIII		
Sr.	Disease	No. of Drugs	Treatment		Total No Of Tablets	Unit Cost		Total Cost at Govt. Rate			Total Cost at Private Rate		
			Drugs	Dosage		Govt. Rate	Pvt. Rate	Adult	6-12 yrs	below 5 yrs	Adult	6-12yrs	below 5 yrs
63	Mumps	1	Tb.Paracetamol 500mg	1/2 tds x 7days	10	0.16	0.25	1.60	0.80	0.53	2.50	1.25	0.83
	Total							1.60	0.80	0.53	2.50	1.25	0.83
64	Night blindness	1	Cp.Vitamin A 50,000 i.u	1bd x 5dys	10	0.68	0.68	6.80	6.80	6.80	6.80	6.80	6.80
	Total							6.80	6.80	6.80	6.80	6.80	6.80
65	Osteo-arthritis	1	Tb.Aspirin 300mg	2tds x 7dys	42	0.05	0.21	2.10	1.05	0.70	8.82	4.41	2.94
	Total							2.10	1.05	0.70	8.82	4.41	2.94
66	Otitis-media	3	Tb.Cotrimoxazole ds	1bds x 5dys	10	0.65	1.48	6.50	3.25	2.17	14.80	7.40	4.93
			Tb.Paracetamol 500mg	1tds x 3dys	9	0.16	0.25	1.44	0.72	0.48	2.25	1.13	0.75
			Inj.Tetanous Toxoid	1stat	1	0.75	1.04	0.75	0.75	0.75	1.04	1.04	1.04
	Total							8.69	4.72	3.40	18.09	9.57	6.72
67	Paralysis/Stroke	1	Tb.Aspirin 300mg	1/4od x 365dys	92	0.05	0.21	4.60	2.30	1.53	19.32	9.66	6.44
	Total							4.60	2.30	1.53	19.32	9.66	6.44
68	Pelvic Infection	1	* Cp.Doxycycline 100mg	2tbs first day 1od x 4days	6	2.3	2.3	13.80			13.80		
			Tb.Metronidazole 200mg	1tds x 5dys	15	0.16	0.36	2.40	Not in children		5.40	Not in children	
			Tb.Ibuprofen 200mg	1tds x 5dys	15	0.48	0.48	7.20			7.20		
	Total							23.40	Not in children		26.40	Not in children	

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I	II	III	IV		V	VI		VII			VIII		
Sr.	Disease	No. of Drugs	Treatment		Total No Of Tablets	Unit Cost		Total Cost at Govt. Rate			Total Cost at Private Rate		
			Drugs	Dosage		Govt. Rate	Pvt. Rate	Adult	6-12 yrs	below 5 yrs	Adult	6-12yrs	below 5 yrs
69	Pyoderma	2	Tb.Cotrimoxazole ds	1bds x 5dys	10	0.65	1.48	6.50	3.25	2.17	14.80	7.40	4.93
			Tb.Paracetamol 500mg	1tds x 3dys	9	0.16	0.25	1.44	0.72	0.48	2.25	1.13	0.75
	Total							7.94	3.97	2.65	17.05	8.53	5.68
70	Pharyngitis viral	3	Tb.Paracetamol 500mg	1tds x 3dys	9	0.16	0.25	1.44	0.72	0.48	2.25	1.13	0.75
			* Tb.Codeine 10mg	1bds x 3dys	6	0.20	0.20	1.20	0.60	0.40	1.20	0.60	0.40
	Total							2.64	1.32	0.88	3.45	1.73	1.15
71	Pharyngitis bacterial	3	Tb.Penicillin V 130mg	2qid x 5dys	40	0.42	0.75	16.80	8.40	5.60	30.00	15.00	10.00
			Tb.Paracetamol 500mg	1tds x 3dys	9	0.16	0.25	1.44	0.72	0.48	2.25	1.13	0.75
			* Tb.Codeine 10mg	1bds x 3dys	6	0.20	0.20	1.20	0.60	0.40	1.20	0.60	0.40
	Total							B 19.44	B 9.72	B 6.48	B 33.45	B 16.73	B 11.15
	Weighted average [4x(A)+1x(B)]x0.2							14.45	7.22	4.82	20.49	10.25	6.83
72	Pneumonia	1	Tb.Cotrimoxazole ds	1bd x 5dys	10	0.65	1.48	6.50	3.25	2.17	14.80	7.40	4.93
			Tb.Paracetamol 500mg	1qid x 3dys	12	0.42	0.75	5.04	2.52	1.68	9.00	4.50	3.00
	Total							11.54	5.77	3.85	23.80	11.90	7.93
73	Ring-worm	1	* Oint.Miconazole	local Application	1	9.00	9.00	9.00	4.50	3.00	9.00	9.00	9.00
	Total							9.00	4.50	3.00	9.00	9.00	9.00

I	II	III	IV		V	VI		VII			VIII		
Sr.	Disease	No. of Drugs	Treatment		Total No Of Tablets	Unit Cost		Total Cost at Govt. Rate			Total Cost at Private Rate		
			Drugs	Dosage		Govt. Rate	Pvt. Rate	Adult	6-12 yrs	below 5 yrs	Adult	6-12yrs	below 5 yrs
74	Rheumatoid-arthritis	1	* Tb.Ibuprofen 400mg	1tds x 5dys	15	0.48	0.48	7.20	3.60	2.40	7.20	3.60	2.40
	Total							7.20	3.60	2.40	7.20	3.60	2.40
75	Scabies	2	* Lot.BHC 100ml	local application	1	5.03	5.03	5.03	5.03	5.03	5.03	5.03	5.03
			Tb.CPM 4mg	1bd x 5dys	10	0.02	0.08	0.20	0.10	0.07	0.80	0.40	0.27
								A	A	A	A	A	A
	Total							5.23	5.13	5.10	5.83	5.43	5.30
76	Scabies infected	3	* Lot.BHC 100ml	local application	1	5.03	5.03	5.03	2.29	2.29	5.03	5.03	5.03
			Tb.CPM 4mg	1bd x 5dys	10	0.02	0.08	0.20	0.10	0.07	0.80	0.40	0.27
			Tb.Cotrimoxazole ds	1bds x 5dys	10	0.65	1.48	6.50	3.25	2.17	14.80	7.40	4.93
								B	B	B	B	B	B
	Total							11.73	5.64	4.52	20.63	12.83	10.23
77	Scorpion bite	2	Ij. Xylocaine 2%	1sos	1	3.00	3.50	3.00	1.50	1.00	3.50	1.75	1.17
	Total							3.00	1.50	1.00	3.50	1.75	1.17
	Weighted average [3x(A)+1x(B)]x0.25							6.85	3.43	2.28	9.53	4.76	3.17
78	Sinusitis	3	Tb.Cotrimoxazole ds	1bds x 5dys	10	0.65	1.48	6.50	3.25	2.17	14.80	7.40	4.93
			Tb.Aspirin 300mg	1tds x 3dys	9	0.05	0.21	0.45	0.23	0.15	1.89	0.95	0.63
			* Tb.Pseudo-ephedrine	20m1tds x 3dys	9	0.81	0.81	7.29	3.65	2.43	7.29	3.65	2.43
	Total							14.24	7.12	4.75	23.98	11.99	7.99

I	II	III	IV		V	VI		VII			VIII		
Sr	Disease	No. of Drugs	Treatment		Total No Of Tablets	Unit Cost		Total Cost at Govt. Rate			Total Cost at Private Rate		
			Drugs	Dosage		Govt. Rate	Pvt. Rate	Adult	6-12 yrs	below 5 yrs	Adult	6-12yrs	below 5 yrs
79	Stomatitis	2	Tb.Bcomplex	1bd x 7dys	14	0.07	0.42	0.98	0.49	0.33	5.88	2.94	1.96
			* Glycerine	100ml L.A	1/2 bottle	6.00	6.00	3.00	3.00	2.00	3.00	3.00	2.00
			*Tb.Folic acid 5mg	1od x 10dys	10	0.03	0.48	0.30	0.15	0.10	4.80	2.40	1.60
	Total							4.28	3.64	2.43	13.68	8.34	5.56
80	Tonsilitis	2	Tb.Penicillin V	1qids x 5dys	20	0.42	0.75	8.40	4.20	2.80	15.00	7.50	5.00
			Tb.Paracetamol 500mg	1tds x 3dys	9	0.06	0.25	0.54	0.27	0.18	2.25	1.13	0.75
	Total							8.94	4.47	2.98	17.25	8.63	5.75
81	Tubectomy	2	Ij. PPF	1/day x 5days	5	3.5	4.00	17.50	8.75	5.83	20.00	10.00	6.67
			Tb.Aspirin 300mg	1tds. x 7days	21	0.05	0.21	1.05	0.53	0.35	4.41	2.21	1.47
	Total							18.55	9.28	6.18	24.41	12.21	8.14
82	Tuberculosis	4	Cp.Rifampin 450mg	1od x 120dys	120	2.66	3.90	319.20	159.60	106.40	468.00	234.00	156.00
			Tb.Isoniazid Hyd. 300mg	1od x 120dys	120	0.05	0.24	6.00	3.00	2.00	28.80	14.40	9.60
			Pyrazinamide	1tds x 60dys	180	1.21	1.34	217.8	108.9	72.6	241.2	120.6	80.4
			Cap. Rifampin 450 mg	1od x 120 dys.	120	2.66	3.9	319.2	159.6	106.4	468.00	234.00	156.00
			Tb. Isoniazid 300 mg	1od x 120dys	120	0.05	0.24	6.00	3.00	2.00	28.80	14.40	9.60
	Total							705.60	352.80	235.20	986.40	493.20	328.80
83	Upper Respiratory Tract Infection (Bacterial)		Tb.Co-trimoxazole d.s	1bds x 5dys	10	0.65	1.48	6.50	3.25	2.17	14.80	7.40	4.93
			Tb.Chlorpheneramine 4mg	sos	4	0.02	0.08	0.08	0.04	0.03	0.32	0.16	0.11
			Tb.Paracetamol 500mg	1tds x 3dys	9	0.16	0.25	1.44	0.72	0.48	2.25	1.13	0.75
	Total							A 8.02	A 4.01	A 2.67	A 17.37	A 8.69	A 5.79

I	II	III	IV		V	VI		VII			VIII		
Sr.	Disease	No. of Drugs	Treatment		Total No Of Tablets	Unit Cost		Total Cost at Govt. Rate			Total Cost at Private Rate		
			Drugs	Dosage		Govt. Rate	Pvt. Rate	Adult	6-12 yrs	below 5 yrs	Adult	6-12yrs	below 5 yrs
84	Upper Respiratory Tract Infection (Viral)	1	Tb.Paracetamol 500mg	1tds x 3dys	9	0.16	0.25	1.44	0.72	0.48	2.25	1.13	0.75
	Total							B 1.44	B 0.72	B 0.48	B 2.25	B 1.13	B 0.75
	Weighted Average [1x(A)+4x(B)]x0.2							2.75	1.38	0.92	5.27	2.63	1.76
85	UTI	2	* Tb.Norflox 400mg	1bds x 5dys	10	4.25	4.25	42.50	21.25	14.17	42.50	21.25	14.17
	Total							42.50	21.25	14.17	42.50	21.25	14.17
86	Urethritis, Cystitis	3	Tb.Co-trimoxazole d.s	1bds x 5dys	10	0.65	1.48	6.50	3.25	2.17	14.80	7.40	4.93
			* Tb.Cital	2tsp x qid 5dys	1	11.1	11.1	11.10	11.10	11.10	11.10	11.10	11.10
			* Tb.Pyridium	1tds x 3dys	9	0.56	0.56	5.04	2.52	1.68	5.04	2.52	1.68
	Total							22.64	16.87	14.95	30.94	21.02	17.71
87	Viral fever	1	Tb.Paracetamol 500mg	1tds x 5dys	15	0.16	0.25	2.40	1.20	0.80	3.75	1.88	1.25
	Total							2.40	1.20	0.80	3.75	1.88	1.25
88	Vaginitis (Monilial)	1	* Pessary Nystatin	1hs x 5dys	5	2.08	2.08	10.40	5.20	3.47	10.40	5.20	3.47
	Total							10.40	5.20	3.47	10.40	5.20	3.47

I	II	III	IV		V	VI		VII			VIII		
Sr.	Disease	No. of Drugs	Treatment		Total No Of Tablets	Unit Cost		Total Cost at Govt. Rate			Total Cost at Private Rate		
			Drugs	Dosage		Govt. Rate	Pvt. Rate	Adult	6-12 yrs	below 5 yrs	Adult	6-12yrs	below 5 yrs
89	Vaginitis (Trichomonal)	1	Tb.Metronidazole 400mg	5tbs stat	10	0.16	0.36	1.60	0.80	0.53	3.60	1.80	1.20
			Treat husband	5tbs stat									
	Total							1.60	0.80	0.53	3.60	1.80	1.20
90	Vomiting/Nausea	1	Tab Metochlopropamide	1SOS	4	0.41	0.41	1.64	0.82	0.55	1.64	0.82	0.55
			Tab Antacid	2QID x 4	8	0.06	0.13	0.48	0.24	0.16	1.04	0.52	0.35
	Total							2.12	1.06	0.71	2.68	1.34	0.90
91	Weakness (e)	2	Tb. Ferrous Sulph 200 mg	1bds x 15dys	30	0.24	0.24	1.5	0.75	0.50	7.20	3.60	2.40
			Tb.Bcomplex	1bds x 15dys	30	0.07	0.42	2.10	1.05	0.70	12.60	6.30	4.20
	Total							3.60	1.80	1.20	19.80	9.90	6.60
92	Worms	1	Tb.Mebendazole 100mg	1bds x 3dys	6	0.74	1.03	4.44	2.22	1.48	6.18	3.09	2.06
	Total							4.44	2.22	1.48	6.18	3.09	2.06

Explanatory Notes

(a) In these Standard Treatment Guidelines, aspirin has been included where anti-inflammatory action is needed; in all other cases involving pain and/or fever, paracetamol has been used. Though, aspirin is cheaper, it can cause serious gastric bleeding even in therapeutic doses.

(a1) This is just a placebo-therapy; the cause of anorexia is to be found out and treated.

(b) Some of the cases of simple diarrhoea would require an antimicrobial, especially in adults. In any case, in practice, doctors have to err on the safer side and prescribe an antimicrobial in atleast some cases of simple diarrhea. Hence inclusion of fuzazolidane in 25% of cases of treatment of even simple diarrhoea.

(c) Since the aim of this exercise is to estimate the annual budget for drug treatment for various common illnesses at PHC - level, the drug cost for long term diseases like diabetes have been worked out for a year.

(d) A variety of symptoms are clubbed together by patients and doctors as indigestion" - fullness after meals, excessive burning, burning or discomfort in the abdomen, colicky pain, loose stools, excessive gas per rectum etc. Antacid has been included in the treatment under the assumption that it would help as a placebo and in cases of hyperacidity or gastritis

(e) Only 15 days' treatment has been given as a therapeutic trial. If the weakness is due to aneamia there will be rapid improvement in the feeling of tiredness and weakness in two weeks. Further treatment would depend upon the outcome of this therapeutic trial.

Prescription Analysis Guidelines

A) Rational Drug prescribed but

1. Used wrongly - (i.e. instead of a proper drug) for eg. Tetracycline in fungal infection instead of a proper antifungal drug - zero marks. But not be counted again in column of unnecessary drugs. If a drug of second or third choice is used, 60% marks and five negative marks in the column - "irrational drugs".

2. Unnecessarily used (i.e. in addition to a proper drug)

a) for eg. an antibiotic in a viral infection - 60% of marks and 5 negative marks in the column of unnecessary drug.

b) In cases where drug-use does not appear to be due to a reasonable desire to play safe, (as in 2a above), - zero marks in the columns- type and dose, for such totally superfluous use and five negative marks in the column - unnecessary drug; e.g. if second analgesic or antibiotic or iron preparation is used unnecessarily. Ten negative marks if the dose of the two preparations together is excessive and hence dangerous.

3. Used as Placebo - eg. Tab. Antacid or Bplex as placebo. 60% marks; if Bplex is 4th or 5th drug, it would mean that there was no need to give it as a placebo. In such case 5 negative marks in the column for unnecessary drug.

4. Strong rational drug used when weaker or cheaper one could have been used, without sacrificing much, the quality of care e.g. use of Tab. Astemazole instead of Tab. CPM. (except in case chronic rhinitis where astemazole is the drug of choice) - 60% marks.

5. Unnecessary injectable or syrup form - 60% marks plus five negative marks in the column "unnecessary injections". For example Inj. Bplex. Unnecessary use of intravenous infusion - ten negative marks. Unnecessary use of the syrup-form or capsule-form - 60% marks.

B) Irrational Drug Prescribed

1. If used as placebo - 60% marks and five negative marks in the column irrational drug. eg. multivitamin in viral fever or in weakness, when used as second drug. If used as 3rd or 4th drug, such use is totally unnecessary. The drug is then not to be considered for the column - type and dose and is given five negative marks in the column - "unnecessary drug".

2. If not used as placebo and contains one ingredient which is indicated - 60% marks and five negative marks in the column - : irrational drug. For e.g. irrational iron-combination in anaemia, analgesic combination in pain etc.

3. If the drug is not used as placebo and is not indicated - 60% marks and 5 negative marks each in the column of unnecessary drug and irrational drug. Eg. wrong antibiotic combination in viral fever. If used wrongly instead of a necessary drug - zero marks (see A-1) and five negative marks in the column "irrational drug". Any irrational combination which is totally superfluous, (e.g. a second tonic or analgesic) is not to be considered for the columns - type and dose and to be given five negative marks each in the columns "unnecessary" and "irrational".

4. Grossly irrational drug (drug which is not used as a placebo and yet is too obsolete or totally useless) - 10 negative marks. e.g. Hb - containing tonics, enzyme - preparations.

C). Hazardous Drug -

Hazardous drug includes i) a drug which is hazardous in itself eg. analgin or E.P. forte. ii) A rational drug used when contraindicated eg. steroids or aspirin in Peptic ulcer, certain drugs in pregnancy etc. or use of oral steroids in ordinary attack of rheumatoid arthritis. Such use is very attractive and hence habit - forming.

If the hazardous drug is useful, (e.g. analgin in fever), 60% of marks and ten negative mark in the column - "hazardous drug".

Use of steroids in fever or itching - 60% of marks plus five negative marks in the column "hazardous drug". Since these conditions and hence such use is not a frequently recurring phenomenon, only five negative marks are to be given instead of ten.

If the hazardous drug is useless or of doubtful value, e.g. Inj. Proluton depot in 1st trimester of pregnancy - zero marks and ten negative marks in the column of hazardous drugs.

D) **Other guidelines**

1. **In case of ordinary diarrhoea** - ORS to be considered as the main drug. In dysentry, antibiotic is the main drug, ORS is the complementary drug. In amoebiasis, ORS has no role. In case of diarrhoea with pain in abdomen or vomiting, drugs for these symptoms to be considered as main drugs along with ORS (5 marks each).

2. If **complementary drug** is not needed and hence not given, full marks for the column of complementary drug eg. in worms mebendazole is the only drug required.

3. **Adequacy of written instructions** not evaluated because none of the prescriptions carry such instructions (how to apply Gamma - BHC, how much ORS and how frequently etc.) Full marks to be given in such cases.

4. **Multiple irrationalities** - If two or more types of irrationalities are committed in the use of a single drug, marks would be reduced accordingly. For example, injectable tetracycline in viral infection would get only 30% of marks and five negative marks each, in the columns - unnecessary drug and unnecessary injection. Similarly, see B-3 above.

5. **Deletions** - prescriptions are deleted from the sample if

a). The handwriting of the doctor or the investigator could not be deciphered.

b). No symptoms or clinical findings have been recorded on case paper.

c) Patients referred to a hospital or specialist after first

aid or cases requiring higher level consultation/ investigations. eg. sterility.

d) Constituents of brand product could not be found out because the brand is not mentioned even in the Indian Pharmaceutical Guide.

e) Prescriptions containing Ayurvedic preparation as the main drug. But if Ayurvedic drugs are there only as complementary, they are to be ignored. Five negative marks to unnecessary Ayurvedic drug.

f) A drug entirely unrelated to the sign/symptom has been prescribed (except a placebo-tonic). e.g. antifungal skin ointment in a case of headache.

g). Conditions like leucorrhea, menorrhagia, whose casual diagnosis is not given, hence drug treatment cannot be evaluated.

Rational Fixed Dose Drug Combinations

Renowned textbooks, renowned National Formularies and WHO have recommended very few FDDCs. These FDDCs are given below by grouping them together as per the rational basis for their Fixed Dose Combination (FDC). (Items marked with asterisk are in the WHO Essential Drug List).

a) Synergism :

* i) Oestrogen-progesterone combination in oral contraceptive pill.

* ii) Glucose plus sodium chloride in ORS powder.

iii) Ganglion-blocking Antihypertensive plus thiazide diuretic.

* iv) Trimethoprim plus sulfamethoxazole.

* v) Sulfadoxine (or equivalent sulfa) plus pyrimethamine for resistant P.Falciparum malaria.

vi) Beta-lactamase susceptible beta-lactum antibiotic plus inhibitor of betalactamase (clauvulanate, sulbactam).

vii) Fluocytosine plus amphotericin B in cryptococcal meningitis.

* viii) Benzoic acid plus salicylic acid as antifungal ointment.

* ix) Levodopa plus carbidopa for Parkinsonism.

x) Vitamin D with calcium for better absorption of calcium.

b) When two or more drugs are often needed together in *invariable* proportion :

* i) Iron plus falic acid.

ii) B complex.

iii) Polyvitamin

iv) Vitamin A and Vitamin D - The dietary sources of these three nutrients are the same. Hence deficiency is often of a combined nature.

v) Isonex plus rifampicin. This helps to reduce emergence of drug resistance.

* vi) Isonex plus Thiacetazone (for the same reason as in v)

* vii) Inj. Dextrose-saline and Inj. Ringer-Lactate.

viii) I.V. Darrow's Solution or Hartman Solution.

ix) Intraperitoneal dialysis solution

x) I.V. Solution for Total Parenteral Nutrition (TPN)

c) **For corrective action :**

i) Isonex plus vitamin B-6. Vitamins B6 prevents peripheral neuritis caused by prolonged use of Isonex.

ii) Ephedrine plus phenobarbitone. Phenobarbitone counters the NS stimulation of ephedrine.

* iii) Magnesium hydroxide plus Aluminium hydroxide. The latter tends to cause constipation, the former is a laxative.

d) **To increase the range or duration of action**

* i) Neomycin with bacitracin local ointment.

ii) Insulin mixtures (to have a 24 hour, stable action).

iii) Inj. Lignocaine with adrenaline (adrenaline causes vasoconstriction and prolongs action of lignocaine).

iv) Inj. Benzyl Penicillin with Inj. Procaine Penicillin. (To get quick onset with 24 hour action).

* v) Inj. DPT or Inj. DT vaccine.

* vi) Inj. Polyvalent Anti Snake Venom Serum.

Annexure : A-IV
Date : _____

PROFORMA FOR RECORDING PRESCRIPTION-DATA

Name of the Investigator_____

Place _____ Pvt Pub Avg.OPD/Day_____

Name of Dr. _____ Deg.____ Age_____ Sex_____

Sr. No.	Clin. Diagnosis/	Age	Sex	No. of Drugs	Drug	Dose

ANNEXURE : A-V

PRESCRIPTION ANALYSIS OF DOCTORS IN SATARA DISTRICT BY GEOGRAPHICAL AREA

Frequency Distribution of Marks Obtained By Various Categories of Doctors (Area-wise and Sector-wise Distributional)

Sector	Clinics	Total Cases	Freq upto 0	Range	Freq 0-4	Range	Freq 5-9	Range	Freq 10-14	Range	Freq 15-19	Range	Freq 20-24	Range	Freq 25-30	Range
Total Sector	121	3582	345		294		471		608		710		572		582	
Public Sector	59	1944	146		135		253		308		406		314		382	
Rural Public	40	1234	85		98		170		191		237		203		250	
Urban Public	7	271	18		9		20		43		71		48		62	
Small Towns	12	439	43		28		63		74		98		63		70	
Private Sector	62	1638	199		159		218		300		304		258		200	
Rural Private	14	352	30		23		64		56		73		65		41	
Urban Private	27	726	88		76		85		149		136		108		84	
Small Towns	21	560	81		60		69		95		95		85		75	

PRESCRIPTION ANALYSIS OF DOCTORS IN SATARA DISTRICT

Frequency Distribution of Marks Obtained By Various Categories of Doctors (Education-wise Distribution)

Sector	Clinics	Total Cases	Freq Range upto 0	Freq Range 0-4	Freq Range 5-9	Freq Range 10-14	Freq Range 15-19	Freq Range 20-24	Freq Range 25-30
Total Sector	121	3582	345	294	471	608	710	572	582
Consultants	13	360	17	28	29	81	79	69	57
Public									
Private	13	360	17	28	29	81	79	69	57
All MBBS	75	2382	194	183	308	377	482	395	443
Public	54	1768	124	115	222	281	370	297	359
Private	21	614	70	68	86	96	112	98	84
All Non Allopaths	28	719	113	72	120	124	126	91	73
Public	5	176	22	20	31	27	36	17	23
Private	23	543	91	52	89	97	90	74	50
All RMPs	5	121	21	11	14	26	23	17	9
Public	0	0							
Private	5	121	21	11	14	26	23	17	9

Annexure : A-VII

Examples of Grossly Irrational Prescriptions (From Winter Season Collection)

Sr. No.	Doctor's Degree & Place	Age	Sex	Symptoms/ clinical diagnosis	No. of Drgs	Prescription
1	MBBS (PHC - Medha)	15	M	Skin disease worm infestation	3	Tab. Aspirin 1/2 tdsx2 day Tab. multivitamin 1 B.D. x 2 days Syrup Ostocalcium 1tsf tds
2	MBBS (PHC - Medha)	24	M	Cold, body-ache, cough	6	Tab. Actifed plain 1 B.D.x Tab. Sepmax 1 B.D.x2 Inj. Terramycin 2cc Tab. multivitamin 1 B.D.x2 Tab. Aspirin 1 B.D.x2 Mist expectorant 2 tsf tds
3	M.S. (Rural Hospital Khandala)	40	M	Burning micturition	3	Inj. Terramycin 1cc Tab. B'plex 1 B.D.x3 dys Tab. Aspirin 1 tdsx3 dys
4	MBBS (PHC - Bhuinj)	35	M	Acidity, nausea, pain in abdomen	4	Tab. Gelucil 1 B.D.x3 dys Tab. Macraberin (B'plex) 1 B.D.x3 days Tab. APC 1 B.D.x3 dys Tab. B'Plex 1 B.D.x3 dys
5	MBBS (PHC - Indoli)	45	M	Headache	4	Inj. vitamin C + Cyanocob lamine Tab. paracetamol 1 B.D.x2 Tab. B'plex 1 B.D.x2 Tab. Calcium 1 tds x 2
6	MBBS (PHC - Rajale)	7	F	Loose motion	3	Syrup Furazolidone 1 tsf tds Tab. Aspirin 1/3 tdsx2 dy Inj. Getamycin 1 cc
7	BAMS (Ayurvedic degree) PHC Nagthane	40	F	Cough, weakness, cold	3	Inj. Dexamethasone + Inj. Gentamycin 1 cc Tab. Aspirin 1 tdsx2dys Tab. B'plex 1 B.D.x 2 dys
8	MBBS (Civil Hospital Satara)	30	F	Pain in abdomen	5	Tab. Baralgan 1 tds Tab. Metrogyl 1 tds Tab. Gelucil 1 tdsx3 dys Tab. M.V./B.C. 1 B.D.x3 d Tab. Belladona 1 B.D.x3 d

Sr. No.	Doctor's Degree & Place	Age	Sex	Symptoms/ clinical diagnosis	No. of Drgs	Prescription
9	M.D. Gynaec. (Private practi-tioner, Talmawale	28	F	Anaemia with hypera-cidity	4	Tab. Furizyme forte (enzyme preparation) 10 D.x15 days Tab. Siloxogen gel (Antacid) 1 tsf tds Tab. Dicloran (Diclofenac Sodium) 1 B.D.x 5 Tab. Bioneuron (B'plex) 1 B.D.x5
10	M.D. (Private practice Karad)	5	M	Mumps	3	Tab. Wymox 125mg (Amoxycil llin) 1 tds x 3 days Polybion syrup (B'plex) 1 tds B.D. x 3 Livomyn syrup (liver toni 1 tsf B.D.x 3
11	DASF (Ayurve-dic diploma) (private practice Karad)	25	M	Viral Fever	4	Inj. Gentamycin 40mg Cap. Terramycin 250mg 1 tds x 2 Tab. CPM 1 tds x 2 Tab. Paracetamol 1/2 tdsx
12	DASF (Private practice Karad)	52	M	Anaemia	4	Tab. Mebendazole 1 B.D.x3 Tab. Metrogyl 20mg 1 tdsx Tab. Livomine 1 tds Tab. B'plex
13	R.M.P. (Unquali-fied) Private practice Wai	26	M	Body - ache		Tab. Septran 1 tdsx3 Tab. Aspirin 1 tdsx3 Tab. Paracetamol 1 tdsx3 Tab. Voveran 50mg 1B.D.x3
14	As above	30	F	Enteric fever	4	Tab. Paracetamol 1 tdsx2 Cap. Hostacycline 2 stat Tab. Aspirin 1 tdsx3 Tab. Ergapyrin 1 tdsx3
15	M.D. (Private practice Satara)	37	F	Tuber-culosis	3	Cap. Livogen 10 D.x30 Tab. Isokoxi 800 (Isonex Ethambutal) 1 tds x 30 Tab. Betnelan (Betametha-sone) 1 tds alternate day

Sr. No.	Doctor's Degree & Place	Age	Sex	Symptoms/ clinical diagnosis	No. of Drgs	Prescription
16	As above	28	M	Burning micturition	4	Tab. Cystone (Ayurvedic) 1 tds x 30 Tab. Lasilactone 50 mg 10 D. x 3 Tab. Mebex 1 B.D. x 3 Electral powder (Oral rehydration) 2 tsf tds x 3
17	MBBS (Private practice at Nagthane)	30	M	Fever with rigors	4	Inj. Lariago (chloroquine) 3.5 cc Tab. Paracetamol 1 B.D.x2 Tab. Avil B.D.x2 Tab. Dexamethasone 1/2B.D x 2
18	As above	5	F	Mumps	4	Inj. Crystalline Penicillin -1 vial Tab. Roscillin 250mg (Ampicillin) 1 B.D. Tab. Dispirin (Aspirin) 1/2 tds Tab. Celestamine (Antihistaminic + steroid) 1/2 tds x 2
19	BAMS (Ayurvedic) graduate) Private practice at Lonand	40	F	General debility	2	I.V. Dextrose, 5% 1 bottle +Inj. Polybion (B'plex)
20	As above	32	M	Diarrhoea	3	Tab. D I Q (Di-Iodo hydroxy Quinoline) 1 tds x 2 Tab. Cyclominal (Antispasmodic) 1 tds x 3 Inj. Gentamycin 2 ml
21	M.D. Private practice at Karad	40	M	Pulmonary Tuberculosis	3	Tab. Isonex 300mg 10D. x 15 days Tab. Salmaplon 4mg (Salbuta -mol) 1 B.D. x 3 Tab. Polybion (B'plex) 10 D x 15 days
22	MBBS	30	F	Severe Anaemia	3	Cap. Haem-up (Haemoglobin containing tonic) 1 B.D. x 15 Haemorange tonic (Haemoglo-

Sr. No.	Doctor's Degree & Place	Age	Sex	Symptoms/ clinical diagnosis	No. of Drgs	Prescription
						bin containing tonic) 2 tsf B.D. x 15 Tab. Ferrous (Iron) 1 tds x 15 days
23	MBBS (PHC - Shirval)	22	F	Conjuncti-vitis	4	Inj. B'plex 1/2 cc I.M. Tab. ASpirin 1/2 tds Tab. Septran (Co-trimexa-zole) 1 tds x 2 days Sulfacetamide eye drops 2 tds
24	R M P (Unquali-fied Regis-tered Practi-tioner at Nagthane)	30	F	Diarrhoea	5	Inj. Macalvit (Calcium + Vit. C) 2cc Inj. Chloromyctin Tab. Furazolidon 1 tds x 2 Tab. Perinorm 1 B.D. x 2 Tab. Enteroquin 2 tds x 3
25	MBBS (PHC - Vaduz)	5	F	Urticaria	3	Tab. Septran (Co-trimexa-zole) 1/2 tds x 3 days Tab Mebendazole 1 B.D. x 3 Tab. Metronidazole 1/2 B.D. x 3 days

(Note :We have added generic names in the bracket for some of the brand names)

Annexure - B-I

Questionnaire

A. General

Place_____ : Doctors' Qualification_____ .

Urban/Rual Year of starting practice_____ .

Number of prescribers practising in the village_____ .

PG_____MBBS_____BAMS_____RMPS_____GFAM_____.

Any other ?_____ .

Population of the village_____. Drainage area_____.

Number of Medical stores in the village_____.

How many Medical Representative visited you last week ?_____.

B. Continuing Medical Education

a. Do you see the relevance of Continuing Medical Education in your day to day practice ? Yes/No

Why ?_____
_____
_____

b. Do you have any sources of Continuing Medical Education ?
Yes/No
If yes, which
1._____
2._____
3._____
4._____

If no, why
_____
_____
_____
_____

c. Which Medical Journals do you suscribe to ?

1. _____
2. _____
3. _____
4. _____
5. _____

d. Which Drug literature do you receive ?

1. _____
2. _____
3. _____
4. _____
5. _____

e. Do you refer to CIMs/MIMs ? Yes/No

C. Medical Association

a.1 Are you a member of the Medical Association ? Yes/No
.2 Waht is its name ?_____
.3 Is it part of Indian Medical Association ? Yes/No
.4 Do you attend its meetings regularly ? Yes/No
.5 How often are the meetings held ?_____

b. How do these meetings benefit you ?

_____
_____
_____

D. Drug Companies

a. Do the visits of the Medical Representative benefit you in any way ? Yes/No
b. H o w ?

_____
_____
_____
_____

c. Does it change the way you prescribe ? Yes/No
d. H o w ?

_____
_____
_____
_____

e. Do you know of any schemes offered by Drug Companies ?
Yes/ No
If yes, what is the scheme

f. Have you received an offer of any such scheme ? Yes/No
What was its form ?

g. Does the drug store substitute what you prescribe ? Yes/No
If yes, then why ?

h. What do you do when such a substitution takes place ?

E. Government Doctors

a. Do you prescribe drugs from the open market ? Yes/No

b. W h y ?

c. Is the drug supply received from the Government adequate ?
Yes/No

d. W h y ?

e. How much of your needs does the present supply fulfill ?
(Give us an idea in % age, 10% - 20%)

_____ less 10 % _____ 10 - 25 % _____ 25 - 50 %
_____ 50 - 75 % _____ > 75 %

BROAD GUIDELINES

What influences prescribing practices ?

1. Formal training, degree, technical technical training of prescriber.

2. Experience of the prescriber.

3. Lack of/or continuing education -
   a. through refresher courses,
   b. - organised by whom,
   c. - what topics do they cover,
   d. - how frequent,
   b. lectures,
      - organised by whom,
      - do you find them useful,
   c. periodicals - weekly/monthly/quarterly/yearly etc.
      - what topics do they cover,
      - who publishes,
      - name of publication.

4. The Role of Drug Companies,
   a. The advertisement in newspapers/TV
   b. Role of Medical Representatives
      - do they visit you
      - how often
      - how many visited in the last month
      - which drugs were they promoting
      - did they leave any written material
      - samples ?
      - gifts ?
   c. Do you know of any schemes that particular drug companies have operating in the pharmacy shops ? (eg. while buying bulk drugs, are any concessions given).
      Do the drug companies sponsor any schemes in hospitals.
      Have you availed of any of them.

5. Competition with other Doctors.
   - How intense is the competition
   - What form does it take
     actual maramari ?
     cut practice ?

   Does any senior doctor in this area influence the prescribing patterns of junior doctors ?

6. What are the patients expectations from you ?
   - do they demand saline bottles/tonics/injections/ capsules etc.
   - what kind of patients does the doctor receive ?
   - if all kinds/particular kind (agricultural workers only), do they make any different kinds of demands on the doctor.

7. How does availability of drug supply in the PHC/at the drug store affect a doctors' prescribing ?

8. Is it common experience that pharmist at the drug store does not given exactly the drug (but a substitute drug) that the doctor prescribes.

9. Does the status as GP/Consultant/etc make a difference.

10. Does the place of work in urban/rural/particular village make a difference
    - what are the problems does the prescriber face ?
    - does proximity to the drug stors, laboratory mean that the doctor have to store a larger/less number of drugs, for dispensing ?

11. How many villages does the doctor practice in ?
    - does the prescribing change from place to place ? why ?

The Supply and Use of Drugs in India

- A sample survey of doctors in Satara District -

The objective of this study is to understand the socio-economic influences on practising doctors in urban and rural areas. We request you to please co-operate with us.

Questionnaire

A. i. Name_____

ii. Qualification_____

iii. Addl training_____

iv. Urban/Rural

v. PHC /RH /Cottage /Civil / Private

vi. Name of place_____

A.1 Percentage of prescription with more than three drugs_____ .

.2 Percentage of prescriptions with irrational drugs_____ .

.3 Percentage of prescriptions with hazardous drugs_____ .

.4 Percentage of prescriptions with irrational injections____ .

.5 Percentage of prescriptions with unnecessary drugs_____ .

.6 Percentage of rational prescriptions_____ .

.7 Percentage semi-rational prescriptions _____ .

.8 Percentage of grossly irrational prescriptions_____.

.9 Average score per prescription _____.(%)

B.1 What was the year you started practice ?_____ .

.2 What were the difficulties you faced while setting up Practise ?_____

_____

_____ .

.3 How many prescribers practise in this village ?_____ .

.4 _____PG _____MBBS _____Non-allopaths _____RMPS.

.5 Are there any other practitioners ? Yes / No

.6 If yes, elaborate

_____

_____

_____.

.7 What is the population in the village ?_____ .

.8 From where all do patients come (drainage area)

_____ .

.9 How many Medical Representatives visited you last week ?

_____ .

.10 How many Medical Stores are there in the village?_____.

.11 How many patients visit in a day ?_____.

.12 What kinds of patients come to you (explain occupation, income groups etc)

_____

_____

_____.

C. Continuing Medical Education

a. Do you see the need to Continuing Medical Education in your day to day practise ? Yes / No

W h y ?

_____

_____

_____.

b. Do you have any sources of Continuing Medical Education ?

Yes / No

If yes, which

1. _____
2. _____
3. _____
4. _____

If no, why

_____
_____
_____
_____

c. Which Medical Journals do you subscribe to ?

1. _____.
2. _____.
3. _____.
4. _____.
5. _____.

d. Which other Drug literature do you receive ?

1. _____.
2. _____.
3. _____.
4. _____.
5. _____.

e. Do you refer to CIMs /MIMs ? Yes / No

D. Medical Association

a.1 Are you a member of the Medical Association ? Yes/No
.2 What is its name ?
.3 Is it part of Indian Medical Association ? Yes/No .
.4 Do you attend its meetings regularly ? Yes/No .
.5 How often are the meetings held ? _____.

b. How do these meetings benefit you ?

_____
_____
_____
_____

E. Drug Companies

a. Do the visits of the Medical Representative benefit you in any way ? Yes/No

b. H o w ?

c. Does if change the way you prescribe ? Yes/No

d. H o w ?

e. Do you know any schemes offered by Drug Companies ? Yes/No

If yes, what is the scheme

f. Have you received an offer of any such scheme ? Yes/No

What was its form ?

g. Does the drug store substitute what you prescribe ? Yes/No

If yes, then why ?

h. What do you do when such a substitution takes place ?

F. Government Doctors

a. Do you prescribe drugs from the open market ? Yes/No

b. W h y ?

c. Is the drug supply received from the Government adequate ? Yes/No

d. W h y ?

ANNEXURE

List of Medicines Supplied To Sub Centres in One Box

HAFFKINE AJINTHA PHARMACEUTICALS LIMITED

(A Govt. Of Maharashtra Undertaking)
B-4, M.I.D.C, Jalgaon - 425 003

Sr.No.	Name of the Product	Pack Qty.
1.	Trimethoprim 80 mg and Sulphamethaxazole 400 mg Tablets I.P.	500 T 1
2.	Aspirin Tablets I.P 300 mg	1000 T 5
3.	Paracetamol Tablets I.P. 500 mg	500 T 1
4.	Aluminium Hydroxide 300 mg. and Magnesium Hydroxide 300 mg Tablets N.F.I	1000 T 1
5.	Mebendazole Tablets I.P. 100 mg.	500 T 1
6.	Polyvitamin Tablets (Prophylactic) N.F.I.	1000 T 1
7.	Furazolidone Tablets I.P. 100 mg	500 T 1
8.	B-Complex Tablets (Therapeutic)	1000 T 4
9.	Antiseptic Cream I.P. 15 gram.	20 Tubes
10.	Benzoic Acid Compound 100 gm Ointment I.P. (Whitefield's ointment)	8 Bottles
11.	Sulphacetamide Eye drops 10% B.P. 5 ml.	20 Bottles
12.	Absorbent cotton Bundle I.P. 500 gm	1 Bundle
13.	Bandage Cloth ISI Mark (Surgical) 5 meter	1

सबसेंटर मधील नर्सेसने
वापरावयाच्या औषधांबद्दलची माहिती

अ.क्र.	औषधाचे नाव	केव्हा वापरतात?	प्रौढास किती गोळ्या?	कोणत्या सूचना देता? दुष्परिणाम टाळण्यासाठी कोणती काळजी घ्याल?
१.	ॲटासिड	१)पोटात जळजळ	दोन गोळ्या ४-६ वेळा	१) हा तात्पुरता उपाय आहे. वारंवार त्रास झाल्यास डॉक्टरकडे पाठवा.
२.	ॲस्पिरिन	१)पोटदुखी सोडून सर्व प्रकारच्या वेदना व सूज. २)तापावरचा तात्पुरता उपाय.	गरजेप्रमाणे १ ते २ गोळ्या दिवसातून २-३ वेळा	१) रिकाम्या पोटी घेऊ नये. सोबत ग्लासभर पाणी प्यावे २) १२ वर्षाखालील मुलांना तापामध्ये देऊ नये. ३) ॲसिडिटी, अल्सर, असल्यास घेऊ नये. ४) या गोळीमुळे आधी काही त्रास झाल्यास घेऊ नये.
३.	तांबी	पहिल्या, दुसऱ्या बाळंतपणानंतर पाळणा लांबवण्यासाठी.		१) पाळीनंतर लगेच बसवावी म्हणजे गर्भारबाईला बसवली जाणार नाही. २) पाळीचा त्रास, पांढरे जाणे इ.त्रास असेल तर बसवू नये. ३)तांबी बसवल्यावर प्रथम काही महिने पाळीला जास्त त्रास होतो. नंतर कमी न झाल्यास तांबी काढावी. ४)योनीमार्गात दोरा लागतो का नाही ते हाताने चाचपून पहावे. ५)दोन वर्षांनी तांबी बदलावी.
४.	फ्युरॅझोलिडोन	१)सलाईन पाजूनही २-३ दिवसात जुलाब कमी न झाल्यास. २)जुलाबासोबत रक्त पडल्यास ३)जुलाबासोबत ताप असल्यास वा पोटात कळ मारल्यास.	१गोळी ३ ते ४ वेळा	१) लघवी केशरी, पिवळी होते. घाबरू नये. २) बरे वाटल्यानंतरही दोन दिवस औषध चालू ठेवावे.

अ.क्र.	औषधाचे नाव	केंव्हा वापरतात?	प्रौढास किती गोळ्या?	कोणत्या सूचना देता? दुष्परिणाम टाळण्यासाठी कोणती काळजी घ्याल?
५.	आयर्न (लोहक्षार)	१. गरोदरपणी चौथ्या महिन्यापासून व नंतर तीन ते सहा महिने २.रक्त कमी असल्यास	१ गोळी सकाळी, १ रात्री तीन ते सहा सहा महिने	१)सुरुवातीला संडासला खडा वा जुलाब झाल्यास वा पोटात भगभग झाल्यास एकच गोळी जेवणानंतर घ्या. २)संडास काळी होते काळजी करू नका.
६.	माला-डी (कुटुंबनियोजन)	पाळणा लांबवण्यासाठी	रोज न चुकता एक गोळी घेणे.	१)अतिरक्तदाब, मधुमेह, कोड. फिट, स्तनात वा, गर्भाशयात गाठ असेल तर आजारवाढतो. म्हणून गोळ्या घेण्याआधी डॉक्टरी तपासणी व नंतर देखरेख आवश्यक. २)गोळी चुकली तर दुसऱ्या दिवशी दोन गोळ्या. दोन दिवस गोळी चुकली तर दुसरी पध्दत गर्भनिरोधासाठी वापरावी. ३)अंगावर पाजणाऱ्या मातेला शक्यतो देऊ नये. ४)पाळीच्या पाचव्या दिवसापासून सुरु करावी.
७.	मेबेंडॅझोल	जंत झाल्यास	सकाळी १ रात्री १ तीन दिवस	गरोदरपणी पहिल्या तीन महिन्यात देऊ नये.
८.	मेथर्जिन	बाळंतपणा नंतर अंगावर जास्त जात असल्यास.	सकाळी १ रात्री १ पाच दिवस.	वार पडल्याशिवाय देऊ नये.
९.	जलसंजीवनी	जुलाब झाल्यास	दर जुलाबानंतर एक ग्लास	२४ तासात वापरावे. नंतर उरलेले सलाईन टाकून द्यावे.
१०.	पॅरासिटॅमॉल	१.पोटदुखी सोडुन सर्व प्रकारच्या वेदना. (पण सूज उतरत नाही) २.तापावरचा तात्पुरता उपाय.	१ गोळी गरजेप्रमाणे दिवसातून ३-४ वेळा	१)आठवड्यापेक्षा जास्त घेऊ नये व लिव्हरच्या तीव्र आजारात घेऊ नये. २)लहान मुलांपासून बाटली दूर ठेवा.

Questions and standard answers about common drugs used by

Nurses in Public Health Facililties
(Translated from original Marathi version)

Sr. No. (1)	Name of the Medicine (2)	What are the indications for its use? (3)	What is the adult dose? (4)	Warnings about side-effects and precautions (5)
1	Antacid Tab (Total Fifteen marks)	Burning sensation or acidity in stomach (Five marks)	2 tabs. 4-6 times a day (Five marks)	For temporary relief only; for repeated problem, refer to the doctor (Five marks)
2	Aspirin Tab (Total Thirty five marks)	i) All body aches except stomach pains ii) Fever (Ten marks)	1 to 2 tabs 2 to 3 times a day (Five marks)	i) Not on empty stomach Take a glassful of water with the tablet. ii) Not to be given below 12 years of age, in fever iii) Not given in case of acidity or ulcer iv) Not to be given if the patient reports any problematic experience of this drug. (Twenty marks)
3	Copper-T	To avoid pregnancy after first or second child-birth	Not applicable	i) To be inserted immediately after menstruation to avoid inserting it in a pregnant woman ii) Not to be inserted in case of pre-existing problems like heavy bleeding, painful menstruation, vaginal infection. iii) Bleeding, pain during menstruation may increase for a few months after Copper-T insertion. iv) Feel for yourself that the thread is present in the vagina.

Sr. No. (1)	Name of the Medicine (2)	What are the indications for its use? (3)	What is the adult dose? (4)	Warnings about side-effects and precautions (5)
	(Total Thirty marks)	(Five marks)		If thread is missing, report to the doctor. v) Change copper-T after 2 years. (Twenty five marks)
4	Furazolidone (Total Thirty marks)	i) If diarrhoea is not reduced in spite of 2-3 days' rehydration ii) Diarrhoea with blood iii) Diarrhoea with fever or colicky pain (Fifteen marks)	1 tab. 3 to 4 times a day (Five marks)	i) Urine turns reddish-yellow; don't worry about it. ii) Continue for two days after relief of symptoms. (Ten marks)
5	Iron tabs. (Total Thirty marks)	i) During pregnancy from 4th month onwards and three months after delivery. ii) Anaemia (Ten marks)	1 tab. once or twice a day for 3 to 6 months (Five marks)	i) Stools turn black. don't worry about it. ii) If gastric irritation or diarrhoea or constipation occurs, take only one tablet a day after meals. (Fifteen marks)
6	Mala-D	To avoid pregnancy	1 tablet daily	i) Pre-existing diseases like hypertension, diabetes, epilepsy leucoderma, growth in the breast, uterus etc. might increase. Hence prior medical check-up is necessary and follow-up is also needed. (Two mark for each condition, ten marks in total) ii) If a tablet is missed take two tablets next day. If two tablets are missed, use a different

Sr. No. (1)	Name of the Medicine (2)	What are the indications for its use? (3)	What is the adult dose? (4)	Warnings about side-effects and precautions (5)
				method of contraception. iii) Start on 5th day of menstruation, this ensures that the lady is not pregnant iv) Avoid in lactating mothers.
	(Total Thirty five marks)	(Five marks)	(Five marks)	(Twenty five marks)
7	Mebendazole (Total ten marks)	To treat worm infestation (Five marks)	1 tablet twice a day for 3 days (Five marks)	
8	Tab. methergin (Total Fifteen marks)	Excessive bleeding after delivery (Five marks)	1 tablet thrice a day for 5-7 days (Five marks)	To be given only after the placenta has been completely expelled and there is no suspicion of retained bits of placenta (Five marks)
9	Oral Rehydration Solution (Fifteen marks)	Diarrhoea (Five marks)	one glassful after each Diarrhoea (Five marks)	Solution must be used within 24 hours after it is prepared. Remaining has to be discarded. (Five marks)
10	Paracetamol (Twenty Five marks)	Same as for Aspirin i) all body aches except stomach pains ii) fever (Ten marks)	1 tablet 3 to 4 times a day (Five marks)	i) Not be to be given in severe liver disease and for not more than 7 days ii) Bottle of syrup of paracetamol should be strictly kept away from children (Ten marks)

SNo	Name of Diseases	Cost of ttment per adult case (Unit Cost)	Costing for Adult Cases (12 yrs or more)				Costing for Child Cases (5-11 yrs)				Costing for Child Cases (below 5 yrs)				Costing for All Cases Grand total			
			No.of Adult Cases (A)	A as % total Cases 7260	Cost of Adult Cases in Rs (a)	a as % total Cost (Rs. 96473	No.of Child Cases (B)	B as % total Cases 7260	Cost of Child Cases in Rs (b)	b as % total Cost (Rs. 96473	No.of Child Cases (C)	C as % total Cases 7260	Cost of Child Cases in Rs (c)	c as % total Cost (Rs. 96473	No.of Total Cases A+B+C = T	T as % of total Cases 7260	Cost of Total Cases in Rs a+b+c	t as % total Cost (Rs. 96473
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
23	Constipation	0.20	20	0.28%	4	0.00%	20	0.28%	2	0.00%	20	0.28%	1	0.00%	60	0.83%	7	0.01%
24	Contussion	1.05	60	0.83%	63	0.07%		0.00%		0.00%		0.00%		0.00%	60	0.83%	63	0.07%
25	Cough/Cold	2.64	120	1.65%	317	0.33%	40	0.55%	53	0.05%	60	0.83%	53	0.05%	220	3.03%	422	0.44%
27	Diarrhoea	3.57	460	6.34%	1642	1.70%	20	0.28%	36	0.04%	240	3.31%	286	0.30%	720	9.92%	1964	2.04%
28	Diarrhoea,Pain	4.98	40	0.55%	199	0.21%	20	0.28%	50	0.05%		0.00%		0.00%	60	0.83%	249	0.26%
30	Dog bite	54.54	220	3.03%	11999	12.44%	100	1.38%	2727	2.83%		0.00%		0.00%	320	4.41%	14726	15.26%
31	Eczema	11.10	60	0.83%	666	0.69%	40	0.55%	222	0.23%	20	0.28%	74	0.08%	120	1.65%	962	1.00%
35	Gastritis	1.45		0.00%		0.00%	20	0.28%	15	0.02%		0.00%		0.00%	20	0.28%	15	0.02%
36	Giddiness	1.58		0.00%		0.00%	20	0.28%	16	0.02%		0.00%		0.00%	20	0.28%	16	0.02%
38	Hypertension	216.81	20	0.28%	4336	4.49%		0.00%		0.00%		0.00%		0.00%	20	0.28%	4336	4.49%
39	Indigestion	1.45	20	0.28%	29	0.03%		0.00%		0.00%		0.00%		0.00%	20	0.28%	29	0.03%
40	Infected Scabies	11.73		0.00%		0.00%		0.00%		0.00%		0.00%		0.00%		0.00%		0.00%
41	Injury/Wound	3.88	480	6.61%	1862	1.93%	140	1.93%	272	0.28%	60	0.83%	78	0.08%	680	9.37%	2212	2.29%
48	Night blindness	6.80	20	0.28%	136	0.14%		0.00%		0.00%		0.00%		0.00%	20	0.28%	136	0.14%
49	Otitis/Earache	8.70	40	0.55%	348	0.36%		0.00%		0.00%	40	0.55%	116	0.12%	80	1.10%	464	0.48%
51	Pharyngitis	14.45	240	3.31%	3468	3.59%	80	1.10%	578	0.60%		0.00%		0.00%	320	4.41%	4046	4.19%
52	Pyoderma	7.95	20	0.28%	159	0.16%		0.00%		0.00%		0.00%		0.00%	20	0.28%	159	0.16%
53	Pyrexia/Fever	1.45	420	5.79%	609	0.63%	80	1.10%	58	0.06%	100	1.38%	48	0.05%	600	8.26%	715	0.74%
54	Scabies	6.85	200	2.75%	1370	1.42%	140	1.93%	480	0.50%	40	0.55%	91	0.09%	380	5.23%	1941	2.01%
56	Sinusitis	14.24	220	3.03%	3133	3.25%		0.00%		0.00%		0.00%		0.00%	220	3.03%	3133	3.25%
58	Stomatitis	4.28	60	0.83%	257	0.27%		0.00%		0.00%	40	0.55%	57	0.06%	100	1.38%	314	0.33%
59	Tonsilitis	8.94	60	0.83%	536	0.56%		0.00%		0.00%		0.00%		0.00%	60	0.83%	536	0.56%
61	URTI	7.36	800	11.02%	5888	6.10%	180	2.48%	662	0.69%	140	1.93%	343	0.36%	1120	15.43%	6894	7.15%
62	UTI	42.50	60	0.83%	2550	2.64%		0.00%		0.00%		0.00%		0.00%	60	0.83%	2550	2.64%
			5420	0.75	Rs.	0.92	1040	0.14	Rs.	0.06	1000	0.14	Rs.	0.02	7260	1.00	Rs.	100.00%
	Total				89125				5712				1635			102.75%	96473	

ANNEXURE : G-I

Prevalence of diseases as reported at the Primary Health Centre OPD and the standard cost of treatment for the same at RATE CONTRACT prices during 1991-92 (Excluding Leprosy and Tuberculosis)

Bhuinj PHC

SNo	Name of Diseases	Cost of ttment per adult case (Unit Cost)	Costing for Adult Cases (12 yrs or more)				Costing for Child Cases (5-11 yrs)				Costing for Child Cases (below 5 yrs)				Costing for All Cases Grand total			
			No.of Adult Cases (A)	A as % total Cases (a)	Cost of Adult Cases in Rs 7260	a as % total Cost Rs. 96473	No.of Child Cases (B)	B as % total Cases (b)	Cost of Child Cases in Rs 7260	b as % total Cost Rs. 96473	No.of Child Cases (C)	C as % total Cases (c)	Cost of Child Cases in Rs 7260	c as % total Cost Rs. 96473	No.of Total Cases A+B+C = T	T as % of total Cases a+b+c	Cost of Total Cases in Rs 7260	t as % total Cost Rs. 96473
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1	Abcess	8.95	20	0.28%	179	0.19%		0.00%		0.00%		0.00%		0.00%	20	0.28%	179	0.19%
2	Abdominal Pain	0.26	120	1.65%	34	0.03%		0.00%		0.00%	60	0.83%	6	0.01%	180	2.48%	39	0.04%
3	Acid peptic	171.00	80	1.10%	13680	14.18%		0.00%		0.00%		0.00%		0.00%	80	1.10%	13680	14.18%
4	Allergic Rash	0.18	60	0.83%	11	0.01%		0.00%		0.00%		0.00%		0.00%	60	0.83%	11	0.01%
5	Allergic Rhinitis	1.62		0.00%		0.00%		0.00%		0.00%		0.00%		0.00%		0.00%		0.00%
6	Amoebiasis	2.40	20	0.28%	48	0.05%		0.00%		0.00%		0.00%		0.00%	20	0.28%	48	0.05%
7	Amoebic dysentry	4.76	100	1.38%	476	0.49%	20	0.28%	48	0.05%		0.00%		0.00%	120	1.65%	524	0.54%
8	ANC	153.75	200	2.75%	30750	31.87%		0.00%		0.00%		0.00%		0.00%		0.00%		0.00%
9	Anaemia	9.00	60	0.83%	540	0.56%		0.00%		0.00%	20	0.28%	60	0.06%	80	1.10%	600	0.62%
11	Arthritis	1.50	180	2.48%	270	0.28%		0.00%		0.00%		0.00%		0.00%	180	2.48%	270	0.28%
14	Bodyache	1.45	560	7.71%	812	0.84%	20	0.28%	15	0.02%		0.00%		0.00%	580	7.99%	827	0.86%
15	Boils	9.20	120	1.65%	1104	1.14%	60	0.83%	276	0.29%	100	1.38%	307	0.32%	280	3.86%	1687	1.75%
16	Bronchitis	7.94	60	0.83%	476	0.49%	20	0.28%	79	0.08%	40	0.55%	106	0.11%	120	1.65%	662	0.69%
18	Caries/Toothache	12.50	80	1.10%	1000	1.04%	20	0.28%	125	0.13%		0.00%		0.00%	100	1.38%	1125	1.17%
21	Common Cold	1.52		0.00%		0.00%		0.00%		0.00%		0.00%		0.00%		0.00%		0.00%
22	Conjunctivitis	1.45	120	1.65%	174	0.18%		0.00%		0.00%	20	0.28%	10	0.01%	140	1.93%	184	0.19%

Prevalence of diseases as reported at the Primary Health Centre OPD and the standard cost of treatment for the same at RATE CONTRACT prices during 1991-1992 (Excluding Leprosy and Tuberculosis)

Indoli PHC

SNo	Name of Diseases	Cost of ttaent per adult case (Unit Cost)	Costing for Adult Cases (12 yrs or more)				Costing for Child Cases (5-11 yrs)				Costing for Child Cases (below 5 yrs)				Costing for All Cases Grand total			
			No.of Adult Cases (A)	A as % total Cases 7260	Cost of Adult Cases in Rs (a)	a as % total Cost Rs. 32114	No.of Child Cases (B)	B as % total Cases 7260	Cost of Child Cases in Rs (b)	b as % total Cost Rs. 32114	No.of Child Cases (C)	C as % total Cases 7260	Cost of Child Cases in Rs (c)	c as % total Cost Rs. 32114	No.of Total Cases A+B+C = T	T as % of total Cases	Cost of Total Cases in Rs a+b+c	t as % total Cost Rs. 32114
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
2	Abdominal Pain	0.28	200	4.03%	56	0.17%	80	1.61%	11	0.03%		0.00%		0.00%	280	5.65%	67	0.21%
3	Acid peptic	171.00	60	1.21%	10260	31.95%		0.00%	0	0.00%		0.00%		0.00%	60	1.21%	10260	31.95%
7	Amebic dysentry	4.76	100	2.02%	476	1.48%	20	0.40%	48	0.15%	20	0.40%	32	0.10%	140	2.82%	555	1.73%
8	ANC	153.75	20	0.40%	3075	9.58%		0.00%		0.00%		0.00%		0.00%		0.00%		0.00%
9	Anaemia	9.00	60	1.21%	540	1.68%		0.00%		0.00%	20	0.40%	60	0.19%	80	1.61%	600	1.87%
10	Anorexia	0.70		0.00%		0.00%		0.00%		0.00%	20	0.40%	5	0.01%	20	0.40%	5	0.01%
11	Arthritis	1.50	140	2.82%	210	0.65%	60	1.21%	45	0.14%		0.00%		0.00%	200	4.03%	255	0.79%
14	Bodyache	1.45	600	12.10%	870	2.71%	100	2.02%	73	0.23%	40	0.81%	19	0.06%	740	14.92%	962	3.00%
18	Caries/Toothache	12.50	20	0.40%	250	0.78%		0.00%		0.00%	20	0.40%	83	0.26%	40	0.81%	333	1.04%
21	Common Cold	1.52	320	6.45%	486	1.51%	120	2.42%	91	0.28%	160	3.23%	81	0.25%	600	12.10%	659	2.05%
25	Cough/Cold	2.64	280	5.65%	739	2.30%	80	1.61%	106	0.33%	60	1.21%	53	0.16%	420	8.47%	898	2.80%
27	Diarrhoea	3.57	280	5.65%	1000	3.11%	100	2.02%	179	0.56%	60	1.21%	71	0.22%	440	8.87%	1250	3.89%
30	Dog bite	54.54	120	2.42%	6545	20.38%	40	0.81%	1091	3.40%		0.00%		0.00%	160	3.23%	7636	23.78%

SNo	Name of Diseases	Cost of ttment per adult case (Unit Cost)	Costing for Adult Cases (12 yrs or more)				Costing for Child Cases (5-11 yrs)				Costing for Child Cases (below 5 yrs)				Costing for All Cases Grand total			
			No.of Adult Cases (A)	A as % total Cases 7260	Cost of Adult Cases in Rs (a)	a as % total Cost (Rs. 32114	No.of Child Cases (B)	B as % total Cases 7260	Cost of Child Cases in Rs (b)	b as % total Cost (Rs. 32114	No.of Child Cases (C)	C as % total Cases 7260	Cost of Child Cases in Rs (c)	c as % total Cost (Rs. 32114	No.of Total Cases A+B+C = T	T as % of total Cases	Cost of Total Cases in Rs a+b+c	t as % total Cost (Rs. 32114
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
31	Eczema	11.10	60	1.21%	666	2.07%		0.00%		0.00%		0.00%		0.00%	60	1.21%	666	2.07%
36	Giddiness	1.58	60	1.21%	95	0.30%		0.00%		0.00%		0.00%		0.00%	60	1.21%	95	0.30%
41	Injury/Wound	3.88	360	7.26%	1397	4.35%	40	0.81%	78	0.24%	20	0.40%	26	0.08%	420	8.47%	1500	4.67%
53	Pyrexia/Fever	1.45	440	8.87%	638	1.99%	140	2.82%	102	0.32%	120	2.42%	58	0.18%	700	14.11%	798	2.48%
54	Scabies	6.85	40	0.81%	274	0.85%	40	0.81%	137	0.43%		0.00%		0.00%	80	1.61%	411	1.28%
58	Stomatitis	4.28	20	0.40%	86	0.27%		0.00%		0.00%	20	0.40%	29	0.09%	40	0.81%	114	0.36%
59	Tonsilitis	8.94		0.00%		0.00%	20	0.40%	89	0.28%		0.00%		0.00%	20	0.40%	89	0.28%
61	URTI	7.36	20	0.40%	147	0.46%	20	0.40%	74	0.23%		0.00%		0.00%	40	0.81%	221	0.69%
62	UTI	42.50	20	0.40%	850	2.65%		0.00%		0.00%		0.00%		0.00%	20	0.40%	850	2.65%
63	Viral Fever	2.40	40	0.81%	96	0.30%	20	0.40%	24	0.07%	20	0.40%	16	0.05%	80	1.61%	136	0.42%
64	Vomiting	2.12	20	0.40%	42	0.13%	20	0.40%	21	0.07%		0.00%		0.00%	40	0.81%	64	0.20%
65	Weakness	3.60	180	3.63%	648	2.02%	20	0.40%	36	0.11%		0.00%		0.00%	200	4.03%	684	2.13%
			3460	0.70	Rs.	0.92	920	0.19	Rs.	0.07	580	0.12	Rs.	0.02	4960	1.00	Rs.	100.00%
	Total				29390				2192				533			100.00%	32114	

Prevalence of diseases as reported at the Primary Health Centre OPD and the standard cost of treatment for the same at RATE CONTRACT prices during 1991-92 (Excluding Leprosy and Tuberculosis)

Khatav PHC

SNo	Name of Diseases	Cost of ttment per adult case (Unit Cost)	Costing for Adult Cases (12 yrs or more)				Costing for Child Cases (5-11 yrs)				Costing for Child Cases (below 5 yrs)				Costing for All Cases Grand total			
			No.of Adult Cases (A)	A as % total Cases 5980	Cost of Adult Cases in Rs (a)	a as % total Cost (Rs. 93017	No.of Child Cases (B)	B as % total Cases 5980	Cost of Child Cases in Rs (b)	b as % total Cost (Rs. 93017	No.of Child Cases (C)	C as % total Cases 5980	Cost of Child Cases in Rs (c)	c as % total Cost (Rs. 93017	No.of Total Cases A+B+C = T	T as % of total Cases 5980	Cost of Total Cases in Rs a+b+c	t as % total Cost (Rs. 93017
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1	Abcess	8.95	60	1.00%	537	0.58%		0.00%		0.00%		0.00%		0.00%	60	1.00%	537	0.58%
2	Abdominal Pain	0.28	160	2.68%	45	0.05%	20	0.33%	3	0.00%		0.00%		0.00%	180	3.01%	48	0.05%
3	Acid peptic	171.00	20	0.33%	3420	3.68%		0.00%	0	0.00%		0.00%	0	0.00%	20	0.33%	3420	3.68%
4	Allergic Rash	0.18	20	0.33%	4	0.00%		0.00%		0.00%		0.00%		0.00%	20	0.33%	4	0.00%
6	Amebiasis	2.40	20	0.33%	48	0.05%		0.00%		0.00%		0.00%		0.00%	20	0.33%	48	0.05%
7	Amebic dysentry	4.76	100	1.67%	476	0.51%	20	0.33%	48	0.05%	60	1.00%	95	0.10%	180	3.01%	619	0.67%
8	ANC	153.75	120	2.01%	18450	19.84%		0.00%		0.00%		0.00%		0.00%	120	2.01%	18450	19.84%
9	Anaemia	9.00	100	1.67%	900	0.97%		0.00%		0.00%	20	0.33%	60	0.06%	120	2.01%	960	1.03%
10	Anorexia	0.70	160	2.68%	112	0.12%		0.00%		0.00%		0.00%		0.00%	160	2.68%	112	0.12%
13	Blocked Nose	0.00	20	0.33%	0	0.00%		0.00%		0.00%		0.00%		0.00%	20	0.33%	0	0.00%
14	Bodyache	1.45	520	8.70%	754	0.81%		0.00%		0.00%		0.00%		0.00%	520	8.70%	754	0.81%
15	Boils	9.20	40	0.67%	368	0.40%		0.00%		0.00%		0.00%	0	0.00%	40	0.67%	368	0.40%
18	Caries/Toothache	12.50	80	1.34%	1000	1.08%	200	3.34%	1250	1.34%		0.00%		0.00%	280	4.68%	2250	2.42%
20	CLW	3.81	300	5.02%	1143	1.23%	140	2.34%	267	0.29%	20	0.33%	25	0.03%	460	7.69%	1435	1.54%
21	Common Cold	1.52	40	0.67%	61	0.07%		0.00%		0.00%	40	0.67%	20	0.02%	80	1.34%	81	0.09%
22	Conjunctivitis	1.45	80	1.34%	116	0.12%		0.00%		0.00%		0.00%	0	0.00%	80	1.34%	116	0.12%
23	Constipation	0.20	80	1.34%	16	0.02%		0.00%		0.00%		0.00%	0	0.00%	80	1.34%	16	0.02%

SNo	Name of Diseases	Cost of ttment per adult case (Unit Cost)	Costing for Adult Cases (12 yrs or more)				Costing for Child Cases (5-11 yrs)				Costing for Child Cases (below 5 yrs)				Costing for All Cases Grand total			
			No.of Adult Cases (A)	A as % total Cases 5980	Cost of Adult Cases in Rs (a)	a as % total Cost Rs. 93017	No.of Child Cases (B)	B as % total Cases 5980	Cost of Child Cases in Rs (b)	b as % total Cost Rs. 93017	No.of Child Cases (C)	C as % total Cases 5980	Cost of Child Cases in Rs (c)	c as % total Cost Rs. 93017	No.of Total Cases A+B+C = T	T as % of total Cases 5980	Cost of Total Cases in Rs a+b+c	t as % total Cost Rs. 93017
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
25	Cough/Cold	2.64	140	2.34%	370	0.40%		0.00%		0.00%	80	1.34%	70	0.08%	220	3.68%	440	0.47%
26	Diabetes	890.60	20	0.33%	17812	19.15%		0.00%		0.00%		0.00%	0	0.00%	20	0.33%	17812	19.15%
27	Diarrhoea	3.57	240	4.01%	857	0.92%	60	1.00%	107	0.12%	80	1.34%	95	0.10%	380	6.35%	1059	1.14%
28	Diarrhoea,Pain	4.98	40	0.67%	199	0.21%	40	0.67%	100	0.11%		0.00%	0	0.00%	80	1.34%	299	0.32%
30	Dog bite	54.54	260	4.35%	14180	15.24%	60	1.00%	1636	1.76%		0.00%	0	0.00%	320	5.35%	15817	17.00%
31	Eczema	11.10		0.00%	0	0.00%		0.00%		0.00%		0.00%	0	0.00%	0	0.00%	0	0.00%
35	Gastritis	1.45	520	8.70%	754	0.81%	40	0.67%	29	0.03%	20	0.33%	10	0.01%	580	9.70%		0.00%
36	Giddiness	1.58	60	1.00%	95	0.10%		0.00%		0.00%		0.00%	0	0.00%	60	1.00%	95	0.10%
38	Hypertension	328.50	40	0.67%	13140	14.13%		0.00%		0.00%		0.00%	0	0.00%	40	0.67%	13140	14.13%
40	Infected Scabies	11.73	20	0.33%	235	0.25%		0.00%		0.00%		0.00%	0	0.00%	20	0.33%	235	0.25%
41	Injury/Wound	3.88	120	2.01%	466	0.50%		0.00%	0	0.00%		0.00%	0	0.00%	120	2.01%	466	0.50%
45	Malaria	5.04	60	1.00%	302	0.33%		0.00%		0.00%		0.00%	0	0.00%	60	1.00%	302	0.33%
46	Migraine	5.28	20	0.33%	106	0.11%		0.00%		0.00%		0.00%	0	0.00%	20	0.33%	106	0.11%
47	Mumps	1.60	20	0.33%	32	0.03%		0.00%		0.00%		0.00%	0	0.00%	20	0.33%	32	0.03%
49	Otitis/Earache	8.70	20	0.33%	174	0.19%		0.00%		0.00%		0.00%	0	0.00%	20	0.33%	174	0.19%
51	Pharyngitis	14.45	140	2.34%	2023	2.17%	140	2.34%	1012	1.09%	20	0.33%	96	0.10%	300	5.02%	3131	3.37%
52	Pyoderma	7.95	20	0.33%	159	0.17%		0.00%		0.00%	20	0.33%	53	0.06%	40	0.67%	212	0.23%
53	Pyrexia/Fever	1.45	60	1.00%	87	0.09%	60	1.00%	44	0.05%	20	0.33%	10	0.01%	140	2.34%	140	0.15%
54	Scabies	6.85	80	1.34%	548	0.59%	40	0.67%	137	0.15%		0.00%	0	0.00%	120	2.01%	685	0.74%
57	Snake bite	102.20	20	0.33%	2044	2.20%		0.00%		0.00%		0.00%	0	0.00%	20	0.33%	2044	2.20%
58	Stomatitis	4.28	60	1.00%	257	0.28%		0.00%		0.00%		0.00%	0	0.00%	60	1.00%	257	0.28%
59	Tonsilitis	8.94	60	1.00%	536	0.58%	20	0.33%	89	0.10%		0.00%	0	0.00%	80	1.34%	625	0.67%
61	URTI	7.36	400	6.69%	2944	3.17%	20	0.33%	74	0.08%	40	0.67%	98	0.11%	460	7.69%	3116	3.35%
62	UTI	42.50	40	0.67%	1700	1.83%		0.00%		0.00%		0.00%	0	0.00%	40	0.67%	1700	1.83%
63	Viral Fever	2.40	60	1.00%	144	0.15%		0.00%		0.00%		0.00%	0	0.00%	60	1.00%	144	0.15%
64	Vomiting	2.12		0.00%		0.00%		0.00%		0.00%		0.00%	0	0.00%	0	0.00%	0	0.00%
65	Weakness	3.60	160	2.68%	576	0.62%		0.00%		0.00%		0.00%	0	0.00%	160	2.68%	576	0.62%
66	Worms	4.45	80	1.34%	356	0.38%	20	0.33%	45	0.05%		0.00%	0	0.00%	100	1.67%	401	0.43%
	Total		4680	78.26%	Rs. 87546	94.12%	880	14.72%	Rs. 4839	5.20%	420	7.02%	Rs. 632	0.68%	5980	100.00%	Rs. 93017	100.00%

ANNEXURE : G-IV

Prevalence of diseases as reported at the Primary Health Centre OPD and the standard cost of treatment for the same at RATE CONTRACT prices during 1991-1992 (Excluding Leprosy and Tuberculosis)

Mayani PHC

SNo	Name of Diseases	Cost of Ttment per (Unit Cost)	Costing for Adult Cases (12 yrs or more)				Costing for Child Cases (5-11yrs)				Costing for Child Cases (below 5 yrs)				Costing for All Cases Grand total			
			No.of Adult Cases (A)	A as % total Cases (5640)	Cost Adult Cases in Rs (a)	a as % total Cost (Rs.) 75795	No.of Child Cases (B)	B as % total Cases (5640)	Cost Child Cases in Rs (b)	b as % total Cost (Rs.) 75795	No.of Child Cases (C)	C as % total Cases (5640)	Cost Child Cases in Rs (c)	c as % total Cost (Rs.) 75795	No.of Total Cases A+B+C = T	T as % total Cases (5640)	Cost Total Cases in Rs a+b+c = t	t as % total Cost (Rs.) 75795
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1	Abcess	8.95				0.00%				0.00%				0.00%	0	0.00%	0.00	0.00%
2	Abdominal Pain	0.28	80	1.42%	22	0.03%	80	1.42%	11	0.01%				0.00%	160	2.84%	102	0.14%
3	Acid peptic	171.00	80	1.42%	13680	18.05%		0.00%	0	0.00%				0.00%	80	1.42%	13680	18.05%
8	AMC	153.75	80	1.42%	12300	16.23%		0.00%	0	0.00%				0.00%	80	1.42%	12300	16.23%
9	Anaemia	9.00	40	0.71%	360	0.47%		0.00%	0	0.00%				0.00%	40	0.71%	360	0.47%
11	Arthritis	1.50	80	1.42%	120	0.16%		0.00%	0	0.00%				0.00%	80	1.42%	120	0.16%
14	Bodyache	1.45	280	4.96%	406	0.54%	40	0.71%	29	0.04%				0.00%	320	5.67%	446	0.59%
16	Bronchitis	7.94	160	2.84%	1270	1.68%	40	0.71%	159	0.21%	80	1.42%	212	0.28%	280	4.96%	1522	2.01%
17	Burns	27.70	40	0.71%	1108	1.46%		0.00%	0	0.00%		0.00%	0	0.00%	40	0.71%	1108	1.46%
18	Caries/Toothache	12.50	40	0.71%	500	0.66%		0.00%	0	0.00%		0.00%	0	0.00%	40	0.71%	500	0.66%
19	Chest pain	1.45	40	0.71%	58	0.08%		0.00%	0	0.00%		0.00%	0	0.00%	40	0.71%	58	0.08%
25	Cough/Cold	2.64	360	6.38%	950	1.25%	160	2.84%	211	0.28%	200	3.55%	176	0.23%	720	12.77%	1286	1.70%
27	Diarrhoea	3.57	80	1.42%	286	0.38%		0.00%	0	0.00%	80	1.42%	95	0.13%	160	2.84%	381	0.50%

SNo	Name of Diseases	Cost of ttaent per (Unit Cost)	Costing for Adult Cases (12 yrs or more)				Costing for Child Cases (5-11yrs)				Costing for Child Cases (below 5 yrs)				Costing for All Cases Grand total			
			No.of Adult Cases (A)	A as % total Cases (5640)	Cost Adult Cases in Rs (a)	a as % total Cost (Rs.) 75795	No.of Child Cases (B)	B as % total Cases (5640)	Cost Child Cases in Rs (b)	b as % total Cost (Rs.) 75795	No.of Child Cases (C)	C as % total Cases (5640)	Cost Child Cases in Rs (c)	c as % total Cost (Rs.) 75795	No.of Total Cases A+B+C = T	T as % total Cases (5640)	Cost Total Cases in Rs a+b+c = t	t as % total Cost (Rs.) 75795
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
28	Diarrhoea,Pain	4.98	40	0.71%	199	0.26%		0.00%	0	0.00%	40	0.71%	66	0.09%	80	1.42%	266	0.35%
29	Diarrhea,Vomiting	4.80	40	0.71%	192	0.25%		0.00%	0	0.00%	40	0.71%	64	0.08%	80	1.42%	256	0.34%
30	Dog bite	54.54	200	3.55%	10908	14.39%	160	2.84%	4363	5.76%	80	1.42%	1454	1.92%	440	7.80%	12522	16.52%
32	Epilepsy	131.40	120	2.13%	15768	20.80%		0.00%	0	0.00%		0.00%	0	0.00%	120	2.13%	15768	20.80%
35	Gastritis	1.45	80	1.42%	116	0.15%		0.00%	0	0.00%		0.00%	0	0.00%	80	1.42%	116	0.15%
36	Giddiness	1.58		0.00%	0	0.00%	40	0.71%	32	0.04%		0.00%	0	0.00%	40	0.71%	40	0.05%
40	Infected Scabies	11.73		0.00%	0	0.00%	40	0.71%	235	0.31%		0.00%	0	0.00%	40	0.71%	40	0.05%
41	Injury/Wound	3.88	960	17.02%	3725	4.91%	160	2.84%	310	0.41%	120	2.13%	155	0.20%	1240	21.99%	4040	5.33%
45	Malaria	5.04	360	6.38%	1814	2.39%	120	2.13%	302	0.40%	120	2.13%	202	0.27%	600	10.64%	2136	2.82%
46	Migraine	5.28	40	0.71%	211	0.28%	40	0.71%	106	0.14%		0.00%	0	0.00%	80	1.42%	251	0.33%
52	Pyoderma	7.95		0.00%	0	0.00%	40	0.71%	159	0.21%		0.00%	0	0.00%	40	0.71%	40	0.05%
54	Scabies	6.85	200	3.55%	1370	1.81%	200	3.55%	685	0.90%		0.00%	0	0.00%	400	7.09%	1570	2.07%
61	UPTI	7.36	80	1.42%	589	0.78%				0.00%	40	0.71%	98	0.13%	120	2.13%	687	0.91%
63	Viral Fever	2.40	80	1.42%	192	0.25%				0.00%		0.00%	0	0.00%	80	1.42%	192	0.25%
65	Weakness	3.60	80	1.42%	288	0.38%				0.00%		0.00%	0	0.00%	80	1.42%	288	0.38%
66	Worms	4.45	40	0.71%	178	0.23%				0.00%	40	0.71%	59	0.08%	80	1.42%	237	0.31%
					Rs.				Rs.				Rs.				Rs	
	Total		3680	65.25%	66611	87.88%	1120	19.86%	6602	8.71%	840	14.89%	2582	3.41%	5640	100.00%	75795	100.00%

Prevalence of diseases as reported at the Primary Health Centre OPD and the standard cost of treatment for the same at RATE CONTRACT prices during 1991-1992 (Excluding Leprosy and Tuberculosis)

Undale PHC

SNo	Name of Diseases	Cost of ttment per (Unit Cost)	Costing for Adult Cases (12 yrs or more)				Costing for Child Cases (5-11yrs)				Costing for Child Cases (below 5 yrs)				Costing for All Cases Grand total			
			No.of Adult Cases (A)	A as % total Cases (3340)	Cost Adult Cases in Rs (a)	a as % total Cost (Rs.) 31741	No.of Child Cases (B)	B as % total Cases (3340)	Cost Child Cases in Rs (b)	b as % total Cost (Rs.) 31741	No.of Child Cases (C)	C as % total Cases (3340)	Cost Child Cases in Rs (c)	c as % total Cost (Rs.) 31741	No.of Total Cases A+B+C = T	T as % total Cases (3340)	Cost Total Cases in Rs a+b+c = t	t as % total Cost (Rs.) 31741
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
2	Abdominal Pain	0.28	40	1.20%	11	0.04%			0	0.00%	0		0	0.00%	40	1.20%	11	0.04%
3	Acid peptic	171.00	60	1.80%	10260	32.32%			0	0.00%	0		0	0.00%	60	1.80%	10260	32.32%
4	Allergic Rash	0.18	20	0.60%	4	0.01%			0	0.00%	0		0	0.00%	20	0.60%	4	0.01%
05	Allergic Rhinitis	1.62	0	0.00%	0	0.00%	20	0.60%	16	0.05%	0		0	0.00%	20	0.60%	20	0.06%
7	Amebic dysentry	4.76	20	0.60%	95	0.30%	0	0.00%	0	0.00%	0		0	0.00%	20	0.60%	95	0.30%
9	Anaemia	9.00	60	1.80%	540	1.70%	0	0.00%	0	0.00%	0		0	0.00%	60	1.80%	540	1.70%
11	Arthritis	1.50	280	8.38%	420	1.32%	0	0.00%	0	0.00%	0		0	0.00%	280	8.38%	420	1.32%
14	Bodyache	1.45	280	8.38%	406	1.28%	0	0.00%	0	0.00%	0		0	0.00%	280	8.38%	406	1.28%
15	Boils	9.20	140	4.19%	1288	4.06%	40	1.20%	184	0.58%	40	1.20%	123	0.39%	220	6.59%	1451	4.57%
18	Caries/Toothache	12.50	20	0.60%	250	0.79%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	20	0.60%	250	0.79%
23	Constipation	0.20	20	0.60%	4	0.01%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	20	0.60%	4	0.01%
24	Contussion	1.05	40	1.20%	42	0.13%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	40	1.20%	42	0.13%
25	Cough/Cold	2.64	140	4.19%	370	1.16%	0	0.00%	0	0.00%	20	0.60%	18	0.06%	160	4.79%	387	1.22%
27	Diarrhoea	3.57	200	5.99%	714	2.25%	0	0.00%	0	0.00%	40	1.20%	48	0.15%	240	7.19%	762	2.40%
30	Dog bite	54.54	40	1.20%	2182	6.87%	40	1.20%	1091	3.44%	20	0.60%	364	1.15%	100	2.99%	2585	8.14%

SNo	Name of Diseases	Cost of Ttaent per (Unit Cost)	Costing for Adult Cases (12 yrs or more)				Costing for Child Cases (5-11yrs)				Costing for Child Cases (below 5 yrs)				Costing for All Cases Grand total			
			No.of Adult Cases (A)	A as % total Cases (3340)	Cost Adult Cases in Rs (a)	a as % total Cost (Rs.) 31741	No.of Child Cases (B)	B as % total Cases (3340)	Cost Child Cases in Rs (b)	b as % total Cost (Rs.) 31741	No.of Child Cases (C)	C as % total Cases (3340)	Cost Child Cases in Rs (c)	c as % total Cost (Rs.) 31741	No.of Total Cases A+B+C = T	T as % total Cases (3340)	Cost Total Cases in Rs a+b+c = t	t as % total Cost (Rs.) 31741
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
33	Fungal infection	14.77	40	1.20%	591	1.86%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	40	1.20%	591	1.86%
35	Gastritis	1.45	20	0.60%	29	0.09%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	20	0.60%	29	0.09%
38	Hypertension	216.81	20	0.60%	4336	13.66%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	20	0.60%	4336	13.66%
41	Injury/Wound	3.88	600	17.96%	2328	7.33%	60	1.80%	116	0.37%	0	0.00%	0	0.00%	660	19.76%	2388	7.52%
45	Malaria	5.04	40	1.20%	202	0.64%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	40	1.20%	202	0.64%
51	Pharyngitis	14.45	40	1.20%	578	1.82%	20	0.60%	145	0.46%	0	0.00%	0	0.00%	60	1.80%	598	1.88%
53	Pyrexia/Fever	1.45	40	1.20%	58	0.18%	20	0.60%	15	0.05%	20	0.60%	10	0.03%	80	2.40%	88	0.28%
54	Scabies	6.85	100	2.99%	685	2.16%	40	1.20%	137	0.43%	0	0.00%	0	0.00%	140	4.19%	725	2.28%
55	Scorpion bite	3.00	20	0.60%	60	0.19%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	20	0.60%	60	0.19%
61	URTI	7.36	460	13.77%	3386	10.67%	60	1.80%	221	0.70%	100	2.99%	245	0.77%	620	18.56%	3691	11.63%
65	Weakness	3.60	40	1.20%	144	0.45%	0		0	0.00%	0	0.00%	0	0.00%	40	1.20%	144	0.45%
66	Worms	4.45	0	0.00%	0	0.00%	0		0	0.00%	20	0.60%	30	0.09%	20	0.60%	30	0.09%
					Rs.				Rs.				Rs.				Rs	
	Total		2780	0.83	28981.	0.91	300	0.09	1924	0.06	260	0.08	836	0.03	3340	100.00%	31741	100.00%

Prevalence of diseases as reported at the Primary Health Centre OPD and the standard cost of treatment for the same at RATE CONTRACT prices during 1991-1992 (Excluding Leprosy and Tuberculosis)

Vaduz PHC

SNo	Name of Diseases	Cost of ttaent per (Unit Cost)	Costing for Adult Cases (12 yrs or more) No.of Adult Cases (A)	A as % total Cases 7260	Cost Adult Cases in Rs (a)	a as % total Cost (Rs.) 76823	Costing for Child Cases (5-11yrs) No.of Child Cases (B)	B as % total Cases 7260	Cost Child Cases in Rs (b)	b as % total Cost (Rs.) 76823	Costing for Child Cases (below 5 yrs) No.of Child Cases (C)	C as % total Cases 7260	Cost Child Cases in Rs (c)	c as % total Cost (Rs.) 76823	Costing for All Cases Grand total No.of Total Cases A+B+C = T	T as % total Cases 7260	Cost Total Cases in Rs a+b+c = t	t as % total Cost (Rs.) 76823
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1	Abcess	8.95	120	1.65%	1074	1.40%		0.00%		0.00%		0.00%	0	0.00%	120	1.65%	1074	1.40%
2	Abdominal Pain	0.28	180	2.48%	50	0.05%		0.00%		0.00%		0.00%	0	0.00%	180	2.48%	50	0.07%
3	Acid peptic	171.00	60	0.83%	10260	9.55%		0.00%		0.00%		0.00%	0	0.00%	60	0.83%	10260	13.36%
4	Allergic Rash	0.18	60	0.83%	11	0.01%		0.00%		0.00%		0.00%	0	0.00%	60	0.83%	11	0.01%
85	Allergic Rhinitis	1.62	0	0.00%	0	0.00%	20	0.28%	16	0.02%		0.00%	0	0.00%	20	0.28%	20	0.03%
6	Amebiasis	2.40	40	0.55%	96	0.09%	0	0.00%	0	0.00%		0.00%	0	0.00%	40	0.55%	96	0.12%
7	Amebic dysentry	4.76	60	0.83%	286	0.27%	60	0.83%	143	0.19%		0.00%	0	0.00%	120	1.65%	346	0.45%
11	Arthritis	1.50	160	2.20%	240	0.22%	0	0.00%	0	0.00%		0.00%	0	0.00%	160	2.20%	240	0.31%
12	Bites	1.20	20	0.28%	24	0.02%	0	0.00%	0	0.00%		0.00%	0	0.00%	20	0.28%	24	0.03%
14	Bodyache	1.45	600	8.26%	870	0.81%	0	0.00%	0	0.00%		0.00%	0	0.00%	600	8.26%	870	1.13%
15	Boils	9.20	0	0.00%	0	0.00%	40	0.55%	184	0.24%		0.00%	0	0.00%	40	0.55%	40	0.05%
16	Bronchitis	7.94	0	0.00%	0	0.00%	0	0.00%	0	0.00%		0.00%	0	0.00%	0	0.00%	0	0.00%
817	Burns	27.70	0	0.00%	0	0.00%	0	0.00%	0	0.00%	20	0.28%	185	0.24%	20	0.28%	185	0.24%
21	Common Cold	1.52	160	2.20%	243	0.23%	20	0.28%	15	0.02%	0	0.00%	0	0.00%	180	2.48%	263	0.34%
23	Constipation	0.20	20	0.28%	4	0.00%	40	0.55%	4	0.01%	0	0.00%	0	0.00%	60	0.83%	44	0.06%
24	Contussion	1.05	160	2.20%	168	0.16%	20	0.28%	11	0.01%	20	0.28%	7	0.01%	200	2.75%	195	0.25%
25	Cough/Cold	2.64	80	1.10%	211	0.20%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	80	1.10%	211	0.27%
27	Diarrhoea	3.57	400	5.51%	1428	1.33%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	400	5.51%	1428	1.86%
28	Diarrhoea,Pain	4.98	0	0.00%	0	0.00%	40	0.55%	100	0.13%	140	1.93%	232	0.30%	180	2.48%	272	0.35%
29	Diarrhea,Vomiting	4.80	60	0.83%	288	0.27%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	60	0.83%	288	0.37%
30	Dog bite	54.54	360	4.96%	19634	18.28%	80	1.10%	2182	2.84%	360	4.96%	6545	8.52%	800	11.02%	26259	34.18%

SNo	Name of Diseases	Cost of Ttaent per (Unit Cost)	Costing for Adult Cases (12 yrs or more)				Costing for Child Cases (5-11yrs)				Costing for Child Cases (below 5 yrs)				Costing for All Cases Grand total			
			No.of Adult Cases (A)	A as % total Cases 7260	Cost Adult Cases in Rs (a)	a as % total Cost (Rs.) 76823	No.of Child Cases (B)	B as % total Cases 7260	Cost Child Cases in Rs (b)	b as % total Cost (Rs.) 76823	No.of Child Cases (C)	C as % total Cases 7260	Cost Child Cases in Rs (c)	c as % total Cost (Rs.) 76823	No.of Total Cases A+B+C = T	T as % total Cases 7260	Cost Total Cases in Rs a+b+c = t	t as % total Cost (Rs. 76823
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
31	Eczema	11.10	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
33	Fungal infection	14.77	0	0.00%	0	0.00%	220	3.03%	1625	2.11%	60	0.83%	295	0.38%	280	3.86%	515	0.67%
34	F.B. eye	2.3	20	0.28%	46	0.04%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	20	0.28%	46	0.06%
36	Giddiness	1.58	60	0.83%	95	0.09%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	60	0.83%	95	0.12%
37	Hepatitis	3.97	20	0.28%	79	0.07%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	20	0.28%	79	0.10%
38	Hypertension	216.81	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
39	Indigestion	1.45	20	0.28%	29	0.03%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	20	0.28%	29	0.04%
41	Injury/Wound	3.88	820	11.29%	3182	2.96%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	820	11.29%	3182	4.14%
43	Ischemic heart	106.75	40	0.55%	4270	3.98%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	40	0.55%	4270	5.56%
45	Malaria	5.04	80	1.10%	403	0.38%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	80	1.10%	403	0.52%
50	Pelvic Infection	23.40	20	0.28%	468	0.44%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	20	0.28%	468	0.61%
51	Pharyngitis	14.45	60	0.83%	867	0.81%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	60	0.83%	867	1.13%
52	Pyoderma	7.95	80	1.10%	636	0.59%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	80	1.10%	636	0.83%
53	Pyrexia/Fever	1.45	380	5.23%	551	0.51%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	380	5.23%	551	0.72%
54	Scabies	6.85	160	2.20%	1096	1.02%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	160	2.20%	1096	1.43%
55	Scorpion bite	3.00	0	0.00%	0	0.00%	100	1.38%	150	0.20%	40	0.55%	40	0.05%	140	1.93%	140	0.18%
56	Sinusitis	14.24	0	0.00%	0	0.00%	100	1.38%	712	0.93%	20	0.28%	95	0.12%	120	1.65%	195	0.25%
57	Snake bite	102.20	20	0.28%	2044	1.90%	100	1.38%	5110	6.65%	60	0.83%	2044	2.66%	180	2.48%	4188	5.45%
58	Stomatitis	4.28	40	0.55%	171	0.16%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	40	0.55%	171	0.22%
59	Tonsilitis	8.94	40	0.55%	358	0.33%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	40	0.55%	358	0.47%
61	URTI	7.36	600	8.26%	4416	4.11%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	600	8.26%	4416	5.75%
62	UTI	42.50	20	0.28%	850	0.79%	0	0.00%	0	0.00%	20	0.28%	283	0.37%	40	0.55%	1133	1.48%
64	Vomiting	2.12	0	0.00%	0	0.00%	240	3.31%	254	0.33%	280	3.86%	198	0.26%	520	7.16%	438	0.57%
65	Weakness	3.60	40	0.55%	144	0.13%	0	0.00%	0	0.00%	0	0.00%	0	0.00%		0.00%		0.00%
66	Worms	4.45	80	1.10%	356	0.33%	0	0.00%		0.00%	0	0.00%		0.00%		0.00%		0.00%
					Rs.				Rs.				Rs.				Rs	
	Total		5140	70.80%	54948	51.56%	1080	14.88%	10505	13.67%	1020	14.05%	9917	12.92%	7260	100.00%	75370	100.00%

ANNEXURE : G-VII

OPD Morbidity Data at PHCs - 1991-1992

Name of PHC _____

Name of investigator _____

Name of disease	Sex	Age		
		Upto 5 yrs	5-12 yrs	above 12 yrs
Abcess	M			
	F			
Acid peptic disease	M			
	F			
Allergic dermatitis	M			
	F			
Allergic rash	M			
	F			
Allergic rhinitis	M			
	F			
Amoebiasis	M			
	F			
Amoegic Dysentry	M			
	F			
Anaemia	M			
	F			
Anorexia	M			
	F			
Anxiety\Neurosis	M			
	F			
Arthritis	M			
	F			
Asthamatic bronchitis	M			
	F			

Category wise (as per WHO essential drug-list)

Comparison of Supply versus need of some important drugs required for curative/symptomatic care in accordance with Standard Drug Treatment Guidelines, for Cases coming to PHC - OPD in 1991 - 92

BHUINJ PHC

(Excluding Tuberculosis and Leprosy)

Sno	WHO Essl. Drug Cat.	Name of Drugs required	Name of Diseases	Unit Doses reqd per case	Adult 12yrs Tot Cases	Adult 12yrs Drug Reqment	Child 5-12y Tot Cases	Child 5-12y Drug Reqment	Child 0-4yrs Tot Cases	Child 0-4yrs Drug Reqment	Govt. Rates (rate contract)	Total amount of drug reqd.	Total Cost of drug reqd. in Rs.	Total amount supplied during 91-92	Total Cost of drug Supplied
1	2	3	4	5	6	7	8	9	10	11	12		14	15	16
			Abcess	9	20	180		0		0	0.05	180			
1	2.1	Tb.Aspirin 300mg	Arthritis	30	180	5400		0		0	0.05	5400			
		(NSAID)	Contusion	21	60	1260		0		0	0.05	1260			
			Infected wound	9	400	3600	140	700	60	180	0.05	4480			
		Total									0.05	11320	566.00	25500	1275.00
2	2.1	Tb.Paracetamol	Tonsilitis	9	60	540		0		0	0.16	540			
		500mg	Pyoderma	9	20	180		0		0	0.16	180			
		(NSAID)	Dogbite	9	220	1980	100	450		0	0.16	2430			
			Body ache	9	560	5040		0		0	0.16	5040			
			Sinusitis	9	220	1980		0		0	0.16	1980			
			Boils	9	120	1080	60	270	100	300	0.16	1650			
			Pharyngitis	9	240	2160	80	360		0	0.16	2520			
			Cold cough	9	120	1080	40	180	60	180	0.16	1440			
			Otitis-media	9	40	360		0	40	120	0.16	480			
			Pyrexia/Fever	9	420	3780	80	360	100	300	0.02	4440			
			Bronchitis	9	60	540	20	90	40	120	0.16	750			
		Total									0.16	21450	3432.00	13500	2160.00
3	2.1	Tb.Ibuprofen	Caries	15	80	1200	20	150		0	0.40	1350			
		400mg	dental												
		(NSAID)	(infected)												
		Total									0.40	1350	540.00	NS	
4	2.2	Tb.Codeine	URTI	4	800	3200	180	360	140	187	0.20	3747			
		10mg	Cold cough	6	120	720	40	120	60	120	0.20	960			
		(Opoid													
		analgesic)													
		Total									0.2	4707	941.33	NS	
5	3	Tb.CPM 4mg													
		(Anti allergic)	Eczema ??	9	60	540	40	180	20	60	0.02	780			
			URTI	4	800	3200	180	360	140	187	0.02	3747			
			Scabies	10	200	2000	140	700	40	133	0.02	2833			
		Total									0.02	7360	147.20	9000	180.00

Sno	WHO Essl. Drug Cat.	Name of Drugs required	Name of Diseases	Unit Doses reqd per case	Adult 12yrs Tot Cases	Adult 12yrs Drug Reqeent	Child 5-12y Tot Cases	Child 5-12y Drug Reqeen	Child 0-4yrs Tot Cases	Child 0-4yrs Drug Reqeent	Govt. Rates (rate contract)	Total amount of drug reqd.	Total Cost of drug reqd. in Rs.	Total amount supplied during 91-92	Total Cost of drug Supplied
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
6	6.22	Tab. Furazolidone 100 mg (Anti-infective)	Diarrheoa	15	460	6900	20	150	240	1200	0.13	8250	1031.25	12000	1500
		Total										8250	103.25	12000	1500.00
7	6.22	Tb. Cotrimexazole d.s. (Antibacterial)	Pyoderma	10	20	200		0		0	0.65	200			
			Pharyngitis	10	240	2400	80	400		0	0.65	2800			
			Sinusitis	10	220	2200		0		0	0.65	2200			
			Tonsilitis	10	60	600		0		0	0.65	600			
			Bronchitis	10	60	600	20	100	40	133	0.65	833			
			Infected wound	10	480	4800	140	700	60	200	0.65	5700			
			Caries dental												
			(infection)	10	80	800	20	100		0	0.65	900			
			Otitis-												
			media	10	40	400		0	40	133	0.65	533			
			Abcess	10	20	200		0		0	0.65	200			
			URTI (weighted												
			average)	2	800	1600	180	180	140	93.3	0.65	1873.3			
			Urethritis,												
		Total									0.65	15839	10295.35	9000	5950.00
8	6.22		Boils	5	120	600	60	150	100	125	175.00	875	1531.25	NS	
9	6.22	8 Tb.Norflox 400mg	UTI	10		0	60	300		0	4.25	300	1275.00	NS	
10	6.22	Antibacterials	Urethritis, Cysti	9		0		0		0	0.56	0			
		Total											2806.25		
	6.41	Tb.Metronidazole 400mg	Trichomoniasis	10		0		0		0	0.16	0			
			Amoebiasis	15	20	300		0		0	0.16	300			
			Amoebic dysentry	15	100	1500	20	150		0	0.16	1650			
		Total									0.16	1950	304.20		
	10	Tb.Ferrous sulph 200mg	Anaemia 88	180	60	10800		0	20	1200	0.05	12000	600.00		
		Total									0.05	933	600.00		0.00
	3	8 Tb.i) Atenelol 50 mg	Hypertension 88											NS	
				243	20	4860					0.8	3888	4860		
		ii) Hydrochloro-thiazide		122	20	2440					0.2	488	440		
		Total		365							0.05		4376.00	NS	0.00

Sno	WHO Essl. Drug Cat.	Name of Drugs required	Name of Diseases	Unit Doses reqd per case	Adult 12yrs Tot Cases	Adult 12yrs Drug Reqeent	Child 5-12y Tot Cases	Child 5-12y Drug Reqeen	Child 0-4yrs Tot Cases	Child 0-4yrs Drug Reqeent	Govt. Rates (rate contract)	Total amount of drug reqd.	Total Cost of drug reqd. in Rs.	Total amount supplied during 91-92	Total Cost of drug Supplied
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
14	13	Dermatological s													
15	13.1	# Oint.Betamethas	Eczema ##	1	60	60	40	20	20	6.6666	10.18	87	882.27	NS	
16	13.6	# Lot.BHC	Scabies	1	200	200	140	70	40	13.333	5.03	283	1423.49		
		Total											2305.76	2	10.06
17		Gastro intestinal	Stomatitis	1	60	60		0	40	13.333	6.00	73	440.00	NS	
18	17	Glycerine	Indigestion	24	20	480		0		0	0.06	480	28.80		
19	17.1	Tb. Antacid	Gastritis	24		0	20	240		0	0.06	240	14.40		
20	17.1	# Tb.Ranitidine 150mg	Acid peptic disease ##	90	240	21600		0		0	1.88	6720	40608.00		
21	17.6	Tb.Bisacodyl 5mg	Constipation	2	20	40	20	20	20	13	0.10	73	7.33		
22	17.2	Tb.Stemetil 10mg	Giddiness	10		0	20	100		0	0.06	100	6.02		
23	17.5	Tb.Belladona	Abdominal pain	4	120	480		0	60	80	0.07	560	37.44		
24	17.7	Pow.ORS	Diarrhea	2	460	920	20	20	240	160	1.60	1100	1760.00		
		Total											42902.00		140.00
25	19.2	Inj.Tetanous toxoid (vaccine)	Dogbite	2	220	440	100	200		0	0.75	640	480.00		
			Otitis-aedia	2	40	80		0	40	80	0.75	80	60.00		
		Total									0.75	720	540.00	5000	3750.00
26	19.3	Inj.Anti Rabies Vac	Dogbite	1	220	220	100	50		0	43.00	270	11610.00	400	17200.00
27	21	E/D Sulfaceta-mide 10%	Conjunctivitis	1	120	120		0		0	2.10	120	25222.00	NS	
28	25.1	Tb.Salbutamol 4mg	Bronchitis	1	60	60	20	10	40	13.333	0.06	83	4.98		
29	27	Cp.vitamin A 50,000 i.u	Night blindness	10	20	200		0		0	0.68	280	190.40		
30	27	Tb. Multivitamin	ANC	15	200	3000		0		0	0.15	450	450.00		
		Total									0.15	730	640.40		
31	27	Tb.Bcomplex	Giddiness	14		0	20	140			0.07	140	9.80		
		Total									0.07	1167	81.69		
		Grand Total											74763.62		25432.53

N.S. Not Supplied

SOME OTHER PUBLICATIONS OF FRCH

1. State Sector Health Expenditures, A Database : All India and the States, 1981 1985 (Ravi Duggal, Sunil Nandraj, Sahana Shetty):
Cost : (Postage Free) Institutions : Rs. 500/- ; US$ 100/- ; £ 50/-; Individuals : Rs. 250/-; US$ 50/-; £ 25/-.

2. State of Health Care in Maharashtra : A Comparative Analysis
(Alex George and Sunil Nandraj);
Cost : Rs. 20/- + Rs. 8 (Postage) US$ 4/-; £ 2/- + Rs. 20 (By Air Mail) or Rs. 8/- (By Sea Mail).

3. Private Sector and Privatisation in the Health Care Services
(Amar Jesani with Saraswathy Anantharam)
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4. Some Issues in Community Participation in Health Care Services
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5. People's Health in People's Hands - Indian Experiences in Decentralised Health Care : A Model for Health in Panchayati Raj - (Eds. Dr. N.H. Antia and Kavita Bhatia);
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6. The Private Medical Sector in India
(Dr. Anant Phadke);
Cost : Rs. 50/- + Rs. 8/- (Postage); US$ 10/-; £ 5/- + Rs. 55/- (By Air Mail) or Rs. 25/- (By Sea Mail).

7. Ralegan Siddhi : A Model for Village Development - R. Awasthi & D.K. Panmand (May, 1994, Pgs.95) **Hard Cover** Rs. 100/US$ 10/£ 5 plus **Soft Cover** Rs. 75/US$ 15/7.50

8. Health Research Study in India : A Review & Annotated Bibliography - FRCH Research Team Cost : In India Rs. 175/- plus Postage : Rs 11.00, Abroad : US$ 35/- £ 17.50 plus, Rs. 119 (Air Mail) Rs. 47 (Sea Mail)

9. Employee Medical Benefits in the Corporate Sector - Ravi Duggal (Nov. 1993, Pgs.61) Rs. 40/US$ 8 / £ 4 plus, Postage Rs. 10 (India) / Rs. 53 (Air Mail)/ Rs. 35 (Sea Mail)

10. Panchayati Raj and Health : Proceedings of the Seminar - Sujatha Rao (July, 1994, Pgs. 17) Rs. 20/ US$ 4/£ 2 plus, postage Rs. 8 (India)/ Rs. 30 (Air Mail) / Rs. 18 (Sea Mail)

11. A Study of Housrehold Health Expenditure in Madhya Pradesh - Alex George & Others (Jan. 1994, Pgs. 137) Rs.60 / US$ 12 / £ 6 plus, Postage Rs. 12 (India) / Rs. 98 (Air Mail) / Rs.47 (Sea Mail)

12. Cost of Health Care : (Ravi Duggal, Suchetha Amin) (1988, Pgs. 126) Rs. 55 / US$ 11 / £ 5.50 plus, Postage Rs. 10 (India) Rs. 95 (Air Mail)/ Rs. 47 (Sea Mail)

13. Social Aspects of Leprosy : (Ravi Duggal, Amar Jesani, Manisha Gupte) (1988, Pgs. 123) Rs. 25/ US$ 5/ £ 5 plus, Postage Rs. 12 (India), Rs. 98 (Air Mail)/ Rs. 47 (Sea Mail)

14. Health Status of the Indian People (Ed: Sonya Gill) (1987, Pgs. 217) Rs. 50/US$ 10/ £5 plus, Postage Rs.11 (India), Rs. 106 (Air Mail)/ Rs. 65 (Sea Mail)

15. Women's Work, Fertility and Access to Health Care : (Manisha Gupte, Anita Borkar) (1987, Pgs. 211) Rs. 25 / US$ 10 / £5 plus, Postage Rs. 13 (India), Rs. 116 (Air Mail) / Rs. 47 (Sea Mail)

A Study of Supply and Use of Pharmaceuticals in Satara District

This is the first district level datailed, critical study in India, of the supply and use of pharmaceuticals. It uses innovative methodologies to get a direct and reliable picture of the drug situation in an averagely developed district and should be of interest to all those who are interested in the analysis of the drug-situation in India.

The overall conclusions of this study are :

- The drug-supply to the public sector in Satara District was less than 3% of the drug sale of Rs.212.8 m. in the private sector during 1991-92. The drug supply to PHCs and RHs suffers from chronic gross shortages and haphazardousness.

- The overall quality of prescriptions of doctors both in public and private sector is low. High proportion of prescriptions contain use of unnecessary, irrational, hazardous drugs and unnecessary injections especially in the private sector. Public Sector prescriptions are more rational than private sector prescriptions. Proportion of rational prescriptions increases with educational qualification.

- There is very little of proper Continuing Medical Education of doctors. This along with the influence of the Medical Representatives, increasing prices drugs and commercial competition amongst doctors influence the prescriptions of doctors in the private sector, whereas in the public sector, the chronic shortage of drugs affects prescriptions, apart from lack of proper CME.

- Knowledge of PHC - nurses about the drugs they use is satisfactory as regards indications and dosage but quite unsatisfactory as regards precautions and side-effects.

- Due to irrational prescriptions,69% and 55% of the money spent on prescriptions in the private and public sector, respectively, is a waste, with an average of 63%. Projected to the Satara-district level, this wastage amounts to Rs.17.7 crores out of the total drug supply of Rs.22 crores.

- Patients visiting government clinics in Satara district have to buy 15% of the drugs prescribed to them, instead of getting all drugs free.

- If all the patients coming to the six PHC under study, were to be adequately and rationally treated, there would be a drug-short fall of Rs. 30284 per PHC. This shortfall can be met by a mere 8.34% increase in the annual recurring expenditure of Rs. 0.363 million per PHC.

- If all the patients in Satara district were to be adequate and rationally treated and if all children and women were to be fully covered in the MCH Programme in 1991-92, the drug-expenditure would have been Rs.20.54 crores, compared to the total drug expenditure of Rs.21.84 crores in Satara district. It is thus, not lack of resources, but its irrational, wasteful use, which is responsible for the unmet drug needs of the Satara district.

The overall drug situation in Satara district is that of 'Poverty Amidst Plenty'.

Dr. Anant Phadke has been involved in the rational drug policy movement for 20 years; has been working with various health organizations and has been writing on a wide range of health issues.

L. Sharda, Pharmacist, is now the Chief Pharmacist, National Institute of Mental Health And Neurological Sciences (NIMHANS).

Ms. Pratibha Mane - She is a pharmacist.

Audry Fernandes, with a post-graduate degree in sociology, has been involved in women's movement

Dr. Amar Jesani, worked for more than 10 years as a senior researcher in FRCH and has been involved in the health-movement on a wide-ranging issues. He is now the co-ordinator of CEHAT, a health reseach organisation.

The Foundation for Research in Community Health
3&4 Trimiti-B Apts. 85, Anand Park, Aundh,
Pune 411 007